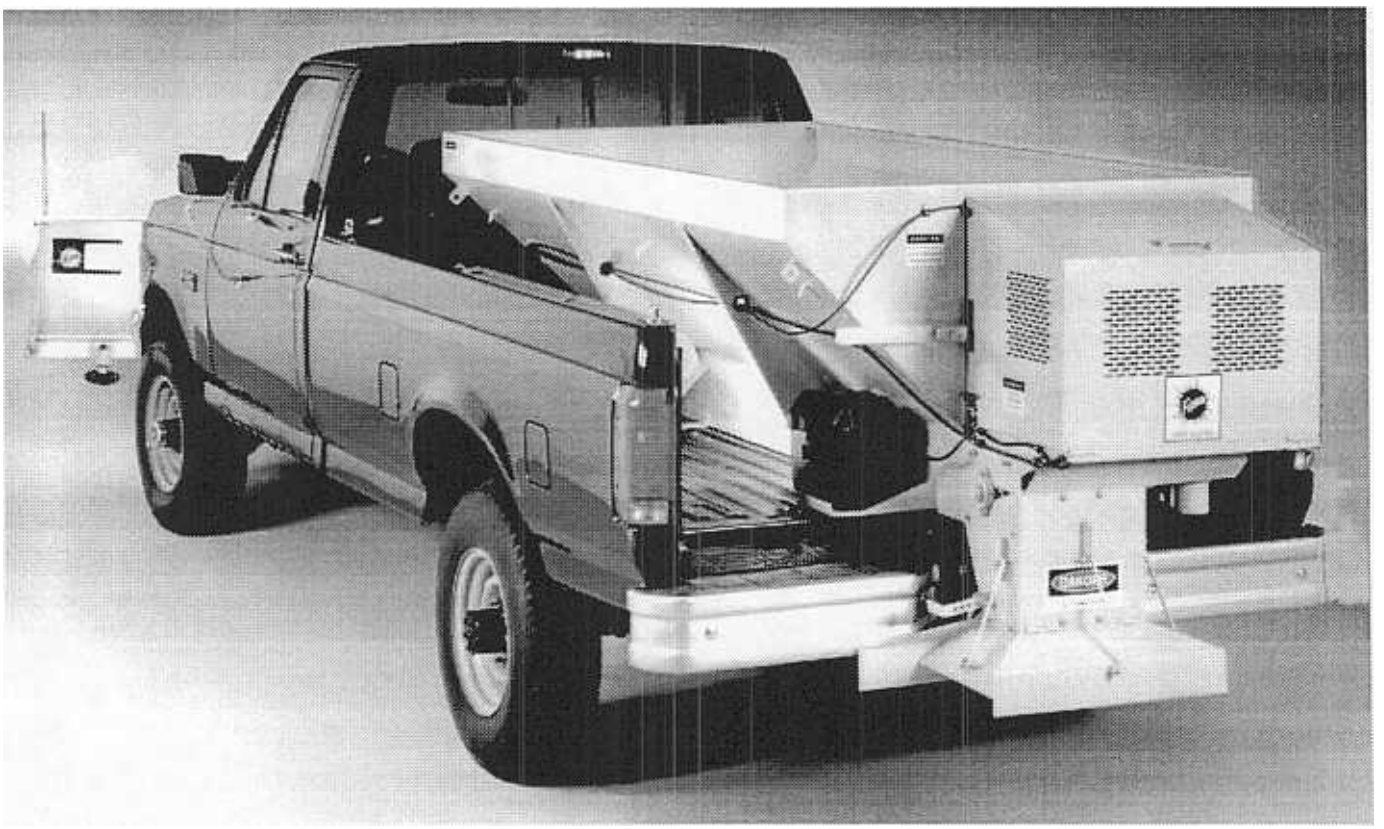
FORM NO. 80324
November 1, 1996

Gasoline Engine Regular and High Capacity Hopper Spreaders Owner's Manual



Read this document before operating the spreader.
This manual is for Fisher Regular and High Capacity Hopper Spreaders with serial numbers (2600 -).

PREFACE

Welcome to the growing family of FISHER® spreader owners.

This manual provides safety, operation, maintenance, repair parts, and accessories information for your new FISHER spreader. To keep your spreader operating safely and efficiently, insist that all operators and maintenance personnel read and understand this manual.

When service is necessary, your local Fisher dealer/distributor knows your spreader best and is interested in your complete satisfaction. Contact your dealer or distributor if you require assistance.

Always obtain original Fisher service parts from your Fisher dealer/distributor. Never accept any substitute items as they could affect the performance and warranty of this product.

Before using your FISHER spreader, make sure your vehicle is equipped with all vehicle manufacturer's and Fisher's recommended options for spreading. Read this manual and all spreader labels before using the spreader.

CAUTION: This spreader is designed to spread snow and ice control materials only. Do not use the spreader for purposes other than those specified in this manual.

Before using your spreader, read this manual carefully and follow its recommendations.

Fisher Engineering reserves the right under its product improvement procedures to change construction or design details and furnish equipment when so altered without reference to illustrations or specifications used herein. Fisher Engineering and the vehicle manufacturer may require and/or recommend optional equipment for hopper spreaders. Do not exceed the gross vehicle weight rating or the gross axle weight rating with a spreader. Fisher Engineering offers a one-year limited warranty for all hopper spreaders. See separately printed pages for this important information. FISHER® is a registered trademark of Douglas Dynamics, L.L.C.

TABLE OF CONTENTS

PREFACE

TABLE OF CONTENTS

SAFETY 1
- Safety Definitions 1
- Safety Precautions 1
- Battery Safety 1
- Spreader Labels 2

GENERAL INFORMATION 4
- Torque Chart 4
- Material Weights 4
- Determining Vehicle Payload 5

OPERATION 7
- Cab Control Identification 7
- Engine Operation 7
  - Starting the Engine 7
  - Stopping the Engine 7
- Clutch Operation 8
- Baffle Adjustment 8

MAINTENANCE 10
- General 10
- Grease 10
- Chains 10
- Electric Clutch 11
- Engine Service and Repair 11

ABBREVIATION KEY 11

PARTS DIAGRAMS AND LISTS . . 12
- Chute Assembly - Regular Capacity 12
- Chute Assembly - High Capacity . 13
- Conveyor Drive and Idler - Regular Capacity 14
- Conveyor Drive and Idler - High Capacity 16
- Engine Drive with Clutch - Regular and High Capacity 18
- Gear Case 20
- Gear Case Assembly 21
  - Housing Pre-assembly 21
  - Cover Pre-assembly 21
  - Output Shaft Pre-assembly 21
  - Input Shaft Pre-assembly 21
  - Assembly of Pre-assembled Parts . . . 21
- Gear Case Disassembly 22
- Feed Gate - Regular Capacity 22
- Feed Gate - High Capacity 23
- Labels - Regular and High Capacity . . . 23
- Cab Control 24
- Clamp Loops 24
- Vehicle Harness 25
- Spreader Harness 25
  - Plug Cover 25
  - Hook 25
- Electric Throttle 26
  - Removal Instructions 26
  - Installation Instructions 26

ACCESSORIES 27
- Center High-Mounted Stoplight (CHMSL) Kit 27
  - Installation Instructions 27
- Inverted Vee Assembly - Regular Capacity Mild Steel 28
  - Installation Instructions 28
- Inverted Vee Assembly - Regular Capacity Stainless Steel 29
  - Installation Instructions 29
- Inverted Vee Assembly - High Capacity 30
  - Installation Instructions 30

Safety Definitions

WARNING: The symbol at left identifies a **SAFETY WARNING** that indicates a potentially hazardous situation that, if not avoided, could result in death or serious personal injury.

CAUTION: Indicates a situation that, if not avoided, could result in damage to product or property.

NOTE: Identifies tips, helpful hints, and maintenance information the reader should know.

Safety Precautions

Observe the following safety procedures before and during the use of the spreader. By following these rules and applying common sense, possible injury and potential damage to the product may be avoided.

WARNING: Do not exceed the GVWR or GAWR as found on the driver-side door cornerpost of the vehicle. See page 5 to calculate the physical payload capacity of your vehicle.

WARNING:

- Before working with the spreader, secure all loose fitting clothing and unrestrained hair.
- Before starting the spreader, check that all personnel and equipment are clear of the spreader and the spray area.
- Before operating the spreader, check that all safety guards are in place.
- Stop the spreader before leaving the vehicle to unclog, adjust, oil, or clean the spreader
- Before servicing the spreader, wait for all movement to stop.
- Keep hands, feet, and clothing away from power-driven parts and the conveyor chain.
- Do not climb on or allow others to climb on the spreader at any time while operating.
- While operating the spreader, use auxiliary warning lights except when prohibited by law.

CAUTION:

- Do not operate a spreader in need of maintenance.
- Before operating the spreader, reassemble any parts or hardware that were removed.
- Before operating the spreader, remove materials such as cleaning rags, brushes, and hand tools from the spreader.

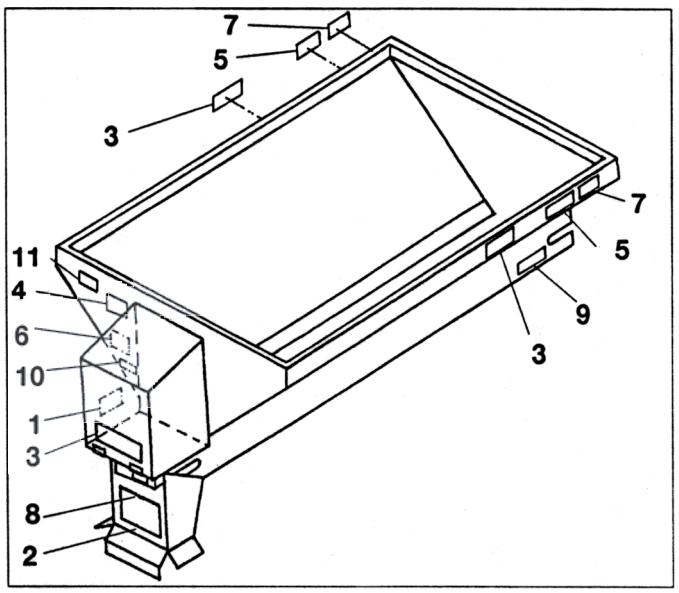
Battery Safety

WARNING: Follow these warnings to avoid personal injury and damage to the equipment.

- Avoid exposing battery to a spark or flame.
- Always charge battery in a well ventilated area.
- Avoid contact with battery acid. It can cause serious personal injury and damage to the equipment.
- Always disconnect battery before removing or replacing any electrical components.
- Never lay anything on a battery. This could result in electrical shock or burns, or damage to the vehicle or equipment.

Spreader Labels

The diagram below indicates the location of the safety and identification labels. The numbers in the diagram correspond to the numbers listed below.



1

WARNING: Gasoline is flammable.
Turn off engine and allow it to cool before filling gas tank.
DO NOT smoke or use open flame within 25 feet of spreader.
Allow spilled gas to evaporate completely before starting engine.
Gasoline engine produces poisonous gases. DO NOT operate in an enclosed area.
Gasoline engine has hot and moving parts that can cause injury.
Use care when working with or near the gasoline engine and its parts.
Shut off engine when not in use, even for short periods of time, to avoid damage to equipment or property.
PN 9131

2

WARNING: Rotating spinner and moving conveyor can cause injury.
Turn off spreader and wait for spinner and conveyor to stop before making any adjustments.
Keep hands, feet, and loose clothing away from spinner and conveyor.
Wear eye protection.
Stay minimum 25 feet away while spinner is rotating.
PN 20599

3 **FISHER® Decal 4-1/2 X 15 (PN 20724)**

4

WARNING: Improper installation and operation can cause injury, and/or equipment and property damage. Read and understand labels and *Owner's Manual* before installing, operating, or making adjustments to spreader. If a replacement manual is needed, contact your distributor.
PN 20598

5

WARNING: Overloaded vehicles can cause accidents.
Do not exceed GVWR and GAWR ratings.
See *Owner's Manual* to determine maximum volumes of spreading material.
PN 9133

6 **Serial Number Label (No P.N.)**

7

WARNING: Do not ride on any part of spreader at any time. This can cause injury.
PN 9129

8

WARNING: Moving parts can cause injury.
Always turn spreader off and wait for movement to stop before refilling hopper or making adjustments.
Keep all guards and labels in place.
PN 9134

9

WARNING: Conveyor can cause injury.
Keep hands, feet, and clothing away from conveyor chain.
Only service conveyor chain after all movement has stopped.
PN 9414

10

WARNING: Electric shock can cause injury.
Disconnect electric power before servicing or performing maintenance.
PN 20600

11

CAUTION: Do not leave unused material in hopper.
Material can freeze or solidify causing unit to not work properly. Empty and clean hopper after each use.
PN 20143

Torque Chart

When tightening fasteners, refer to Table 1, Torque Chart, for the recommended fastener torque values.

Table 1: Torque Chart

Recommended Fastener Torque Chart (Ft.-Lb.)			
Size	SAE Grade 2	SAE Grade 5	SAE Grade 8
1/4-20	6	9	13
5/16-18	11	18	28
3/8-16	19	31	46
3/8-24	24	46	68
7/16-14	30	50	75
1/2-13	45	75	115
9/16-12	66	110	165
5/8-11	93	150	225
3/4-10	150	250	370
7/8-9	202	378	591
1-8	300	583	893
Metric Grade 8.8 (Ft.-Lb.)			
Size	Torque	Size	Torque
M 6	7	M 12	60
M 8	17	M 14	95
M 10	35	M 16	155
These torque values apply to mount assembly fasteners except those noted in the instruction.			

Material Weights

Refer to Table 2, Material Weights, for the weight per cubic yard of common spreading materials.

Table 2: Material Weights

MATERIAL	WEIGHT (lb. per cubic yd.)
Fine Salt - Dry	2,025
Coarse Salt - Dry	1,431
Coarse Sand - Dry	2,700
Coarse Sand - Wet	3,240
Cinders	1,080

Regular Capacity

See Figure 1 to determine the correct amount of spreading material for the regular capacity hopper spreader.

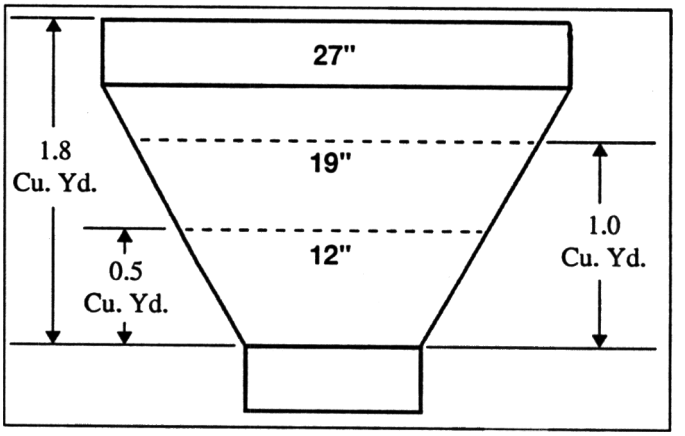


Figure 1

High Capacity

See Figure 2 to determine the correct amount of spreading material for the high capacity hopper spreader.

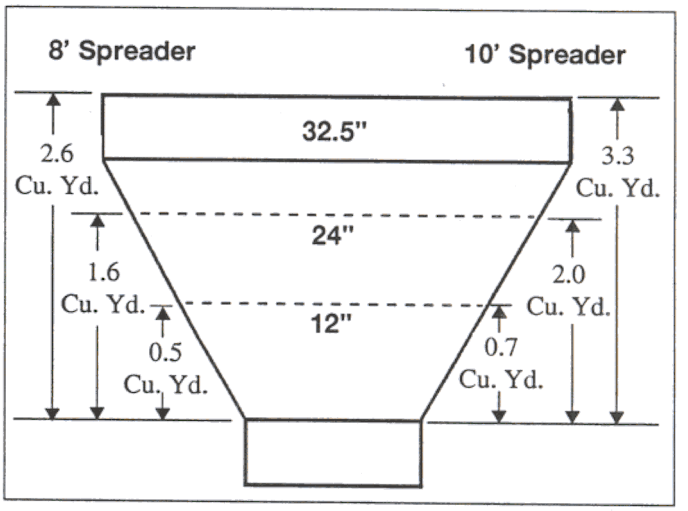


Figure 2

Determining Vehicle Payload

WARNING: Check vehicle's load rating certification sticker for the maximum vehicle capacity. DO NOT load beyond the vehicle's GVWR and GAWR ratings. Overloading could result in an accident or damage to the vehicle.

Use Table 3 to record information.

1. Install hopper spreader and optional equipment according to the instructions.
2. Install or attach any other equipment that will be on the vehicle while the hopper spreader will be in use (step bumper, trailer hitch, snowplows, etc.).
   Fill gas tanks.
3. Obtain the Gross Vehicle Weight Rating (GVWR), Front Gross Axle Weight Rating (FGAWR), and Rear Gross Axle Weight Rating (RGAWR) from the certification label located inside the driver-side door jam.
4. With the occupants in truck for normal hopper spreader operation, weigh vehicle to obtain gross vehicle weight (GVW).
5. Subtract the GVW from the GVWR to determine the available payload to carry the material.
6. Obtain the weight per cubic yard (lb./cu. yd.) of the desired material from Table 2, page 4.

   Divide the weight into the payload to determine the maximum volume of material that can be carried.
7. Compare the maximum volume to Figures 1 or 2 on page 4 to determine the maximum height of the material in the hopper spreader.
8. Fill hopper with the material to the height calculated. Re-weigh vehicle with occupants and verify the GVW, Front Gross Axle Weight, and Rear Gross Axle Weight are less than the vehicle's ratings.
9. Repeat steps 7 and 8 for each type of material.

Refer to Table 3 on page 6 for an example and worksheet.

Table 3: Determining Vehicle Payload

Material Type	Example: Coarse Salt - Dry				
Equipment installed when vehicle was weighed	RC Mild Steel 8' Hopper Spreader				
Front Gross Axle Weight Rating (FGAWR)					
Rear Gross Axle Weight Rating (RGAWR)					
Gross Vehicle Weight Rating (GVWR) (lb.)	8600				
Gross Vehicle Weight (GVW) (lb.) (empty)	- 6500	-	-	-	-
Payload Available (lb.)	= 2100	=	=	=	=
Material Weight (lb./cu. yd.)	÷ 1431	÷	÷	÷	÷
Maximum Volume (cu. yd.)	= 1.47	=	=	=	=
Maximum Height (Approximate) (in.)	24"				
Loaded Front Gross Axle Weight (FGAW) (lb.)					
Loaded Rear Gross Axle Weight (RGAW) (lb.)					
Loaded Gross Vehicle Weight (GVW) (lb.)					

Table 4: Spreader Specifications

Spreader Description	Overall Spreader Length (inches)	Empty Weight (lb.) (No screen or battery)	Capacity Struck (cu. yd.)	Capacity Rounded (cu. yd.)	Overall Width (inches)	Overall Height (inches)	Recommended Use
Regular Capacity 8' Hopper Body 16 Gauge Stainless Steel	113	624	1.8*	2.3*	50-3/4	32-1/2	3/4 or 1 Ton Pick-up Trucks above 8500 lb. GVWR
Regular Capacity 8' Hopper Body 12 Gauge Mild Steel	113	820	1.8**	2.3**	50-3/4	32-1/2	
High Capacity 8' Hopper Body 12 Gauge Mild Steel	113	1000	2.6	3.2	58	41	Dump or Flat Bed Trucks above 15,000 lb. GVWR
High Capacity 10' Hopper Body 12 Gauge Mild Steel	137	1200	3.3	4.1	58	41	

' Side Extensions are not recommended for the 16 Gauge Stainless Steel Spreader and will void all warranties.

'* 6" Side Extension adds 0.6 cu. yd. capacity, 12" Side Extension adds 1.2 cu. yd. capacity.

Cab Control Identification

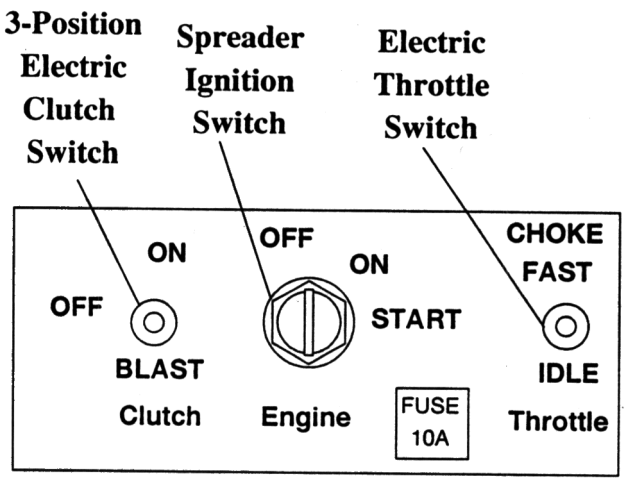


Figure 3

NOTE: The conveyor and spinner will operate when the clutch switch is in the ON or BLAST position.

Engine Operation

Refer to Figure 3 as a reference for starting and stopping the engine.

Starting the Engine

NOTE: Read and understand the engine manufacturer's *Owner's Manual* before starting the engine.

Turn the vehicle ignition switch to ON.

2. Verify the clutch switch is OFF.

Turn the spreader ignition switch (labeled "Engine" on the cab control) to ON.

4. Move the throttle switch to IDLE and hold for two seconds; release.
5. Turn the spreader ignition switch to START.

While the engine is cranking, move the throttle switch to CHOKE/FAST.

When the engine starts to fire, release the throttle switch.

8. When the engine starts, release the ignition switch.

NOTE: If the engine does not start after 10 seconds of cranking, turn both vehicle and spreader ignition switches to OFF and see the *Briggs & Stratton Owner's Manual* that is shipped with the spreader.

9. After the engine starts, move the throttle switch to IDLE and hold for 1/2 - 1 second to release the choke.
10. To control the engine speed:
    - *Increase*: hold the throttle switch at CHOKE/FAST.
    - *Decrease*: hold the throttle switch at IDLE.

NOTE: Maximum engine speed is obtained just prior to choking the engine.

Stopping the Engine

1. Move the throttle to IDLE and hold for two seconds.
2. Turn the spreader ignition switch to OFF.

CAUTION: Always empty the spreader when not in use to prevent a frozen conveyor chain. If the chain becomes "stuck" or "frozen," remove the material from the hopper and free the chain, or move the spreader to a warm area to thaw the material.

CAUTION: Do not attempt to free the chain by using a pipe wrench or any other tool on the output shaft of the gear case. The gear case is designed to accept torque from the input shaft only. Attempts to turn the output shaft will strip the gears and void any warranty.

Clutch Operation

. Start the engine.

2. Adjust the speed to slightly above idle.

3. Move the clutch switch to ON.

CAUTION: To prevent premature spinner chain failure and chain tension loss, engage the electric clutch at the lowest possible RPM without stopping the engine.

4. Increase the engine speed to the desired RPM.

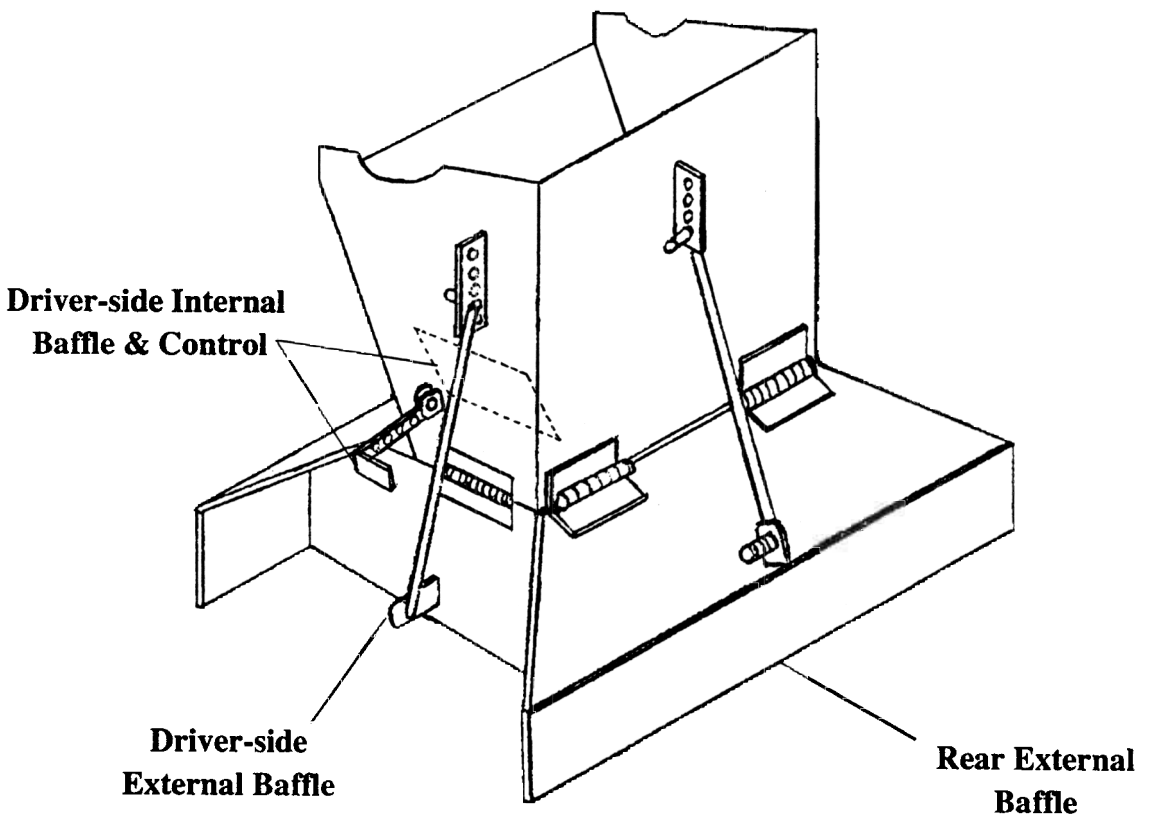
Baffle Adjustment

Spread pattern and the amount of material dispensed depends on engine RPM, gate position, and baffle settings.

- *Decreasing* RPM and/or gate-opening will *decrease* the amount of material coming to the spinner.
- *Increasing* RPM and/or gate-opening will *increase* the amount of material coming to the spinner.

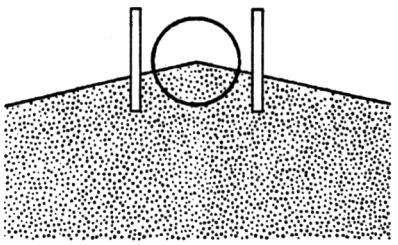
See Figure 4, and Figures 5 and 6 on the next page.

Figure 4

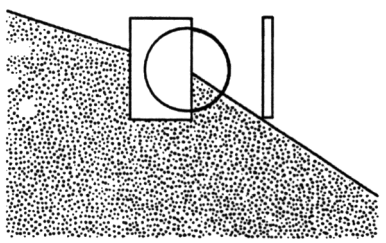


These figures are as viewed from the top of the spinner looking down.

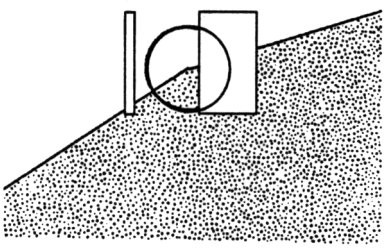
Figure 5



Both internal baffles out

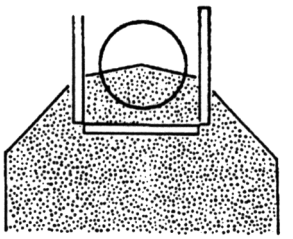


Driver-side baffle in, curb-side baffle out

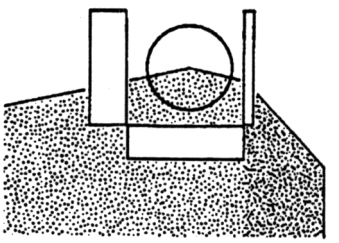


Driver-side baffle out, curb-side baffle in

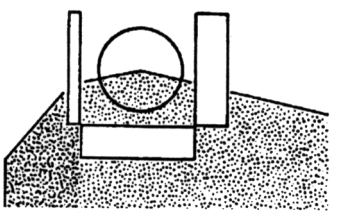
Figure 6



All baffles adjusted down for a confined spread pattern



Curb-side baffle deflects material down; heavy on curb side



Driver-side baffle deflects material down; heavy on driver side

General

At the end of the season, oil or paint all bare surfaces after washing and before storing the unit.

Grease

CAUTION: Over-greasing may cause seal damage. The gear case must be filled to the oil-level plug with SAE 90 gear-type lubricant. Keep the breather plug clean.

- Use dielectric grease on all electrical connections at the beginning and end of each season, and as required during the season.
- After every 10 hours of operation, grease the idler bearings on the idler shaft, flanged bearings on the drive shaft and the input shaft above the gear case, and the spinner shaft bearings.
- After every 50 hours of operation, grease the input shaft bearing on the gear case and verify the oil level of the gear case is level with the fill hole.
- Change gear case oil once a year. Drain oil by removing the side cover of the gear case. Refill with SAE 90 weight gear oil. Oil level should be even with the fill hole.

Chains

CAUTION: Over-tightening the roller chains may damage the bearings on the gear case, the engine, and/or the spinner shaft. Over-tightening will also shorten the life of the roller chain and of the sprockets.

At the beginning of each season, and once a month during the season, verify the drive sprocket set screws are tight.

- Maintain spinner shaft-to-gear case roller chain tension. Correct chain tension allows 5/16" deflection midway between the sprockets. See Figure 7.
  To increase chain tension: loosen the bearing mounting hardware and pull the spinner shaft away from the gear case. Make sure the spinner shaft is vertical and the sprockets are lined up before re-tightening the fasteners. Oil this chain after each use, and at the end of the season.

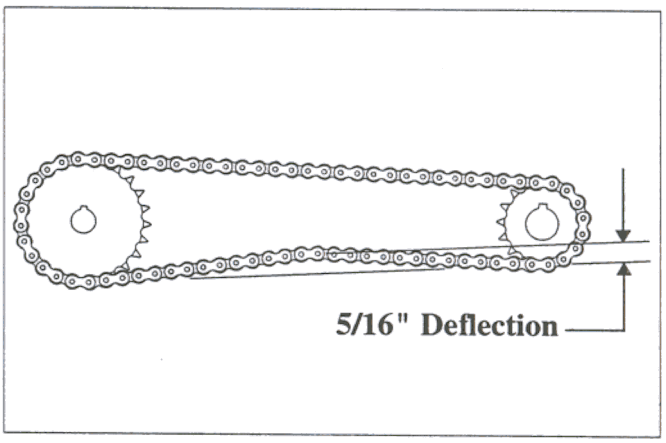


Figure 7

- Maintain engine-to-electric clutch roller chain tension. Correct tension allows 5/16" deflection midway between sprockets. See Figure 8.

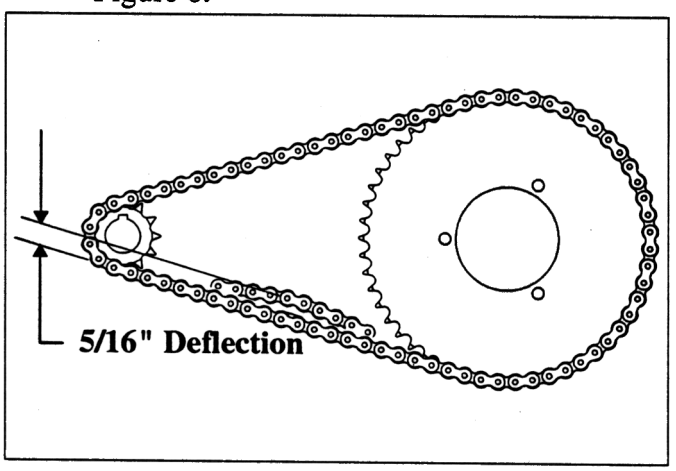


Figure 8

To increase chain tension: loosen the four engine mount-to-engine base bolts and pull the engine away from the electric clutch. Re-tighten bolts. Oil this chain after each use, and at the end of the season.

Periodically check the conveyor chain tension.

To check the tension, measure in 20"-24" from the rear edge of the sills. Push up on the chain with your hand. The conveyor chain should lift 1"-3" off the conveyor chain guide or cross angles. See Figure 9.

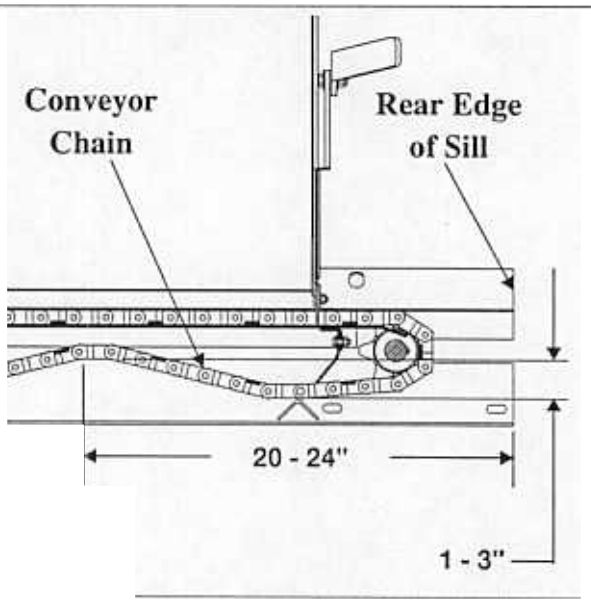


Figure 9

- Use the (2) 5/8" x 6" take-up bolts at the front of the spreader to adjust the conveyor chain tension. Turn both sides equal amounts to ensure the tension is equally distributed across both sides of the conveyor chain.
- Always empty the spreader when it is not in use to prevent a frozen conveyor chain.

Electric Clutch

To minimize problems and extend the life of the electric clutch, do the following:

- At the end of each snow season, remove and clean the clutch.
- After cleaning the clutch, coat both mating surfaces of the clutch with oil or light grease.
- Remove oil and grease prior to using the clutch again.

Engine Service and Repair

Maintain the spreader engine according to the *Briggs & Stratton Engine Owner's Manual* that is shipped with the spreader. Engine warranty is covered by Briggs & Stratton and is described in the back of the manual.

If service or repair is needed, contact an authorized Briggs & Stratton Service Center. To serve you promptly, the Service Center will need the model, type, and code number for your engine.

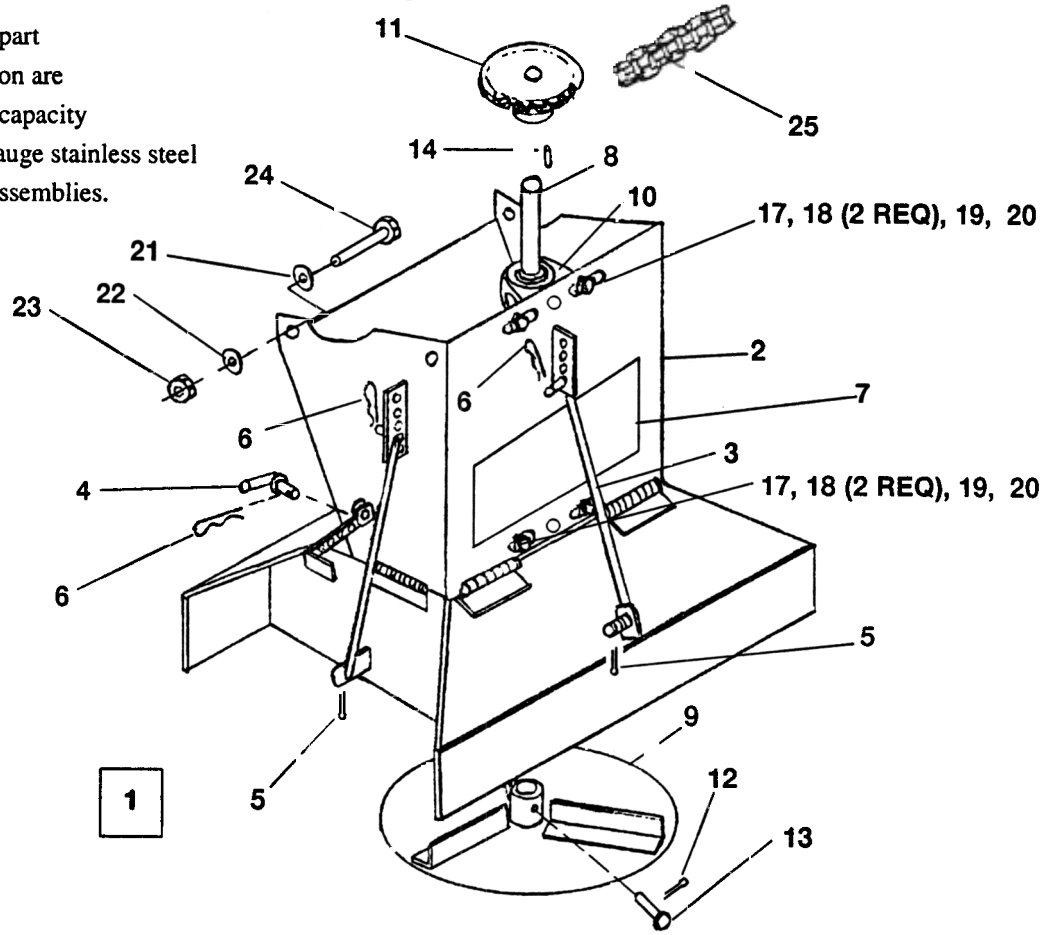
Your nearest service center is listed in the "Yellow Pages" under "Engines, Gasoline" or "Gasoline Engines."

ABBREVIATION KEY

AR	As Required
ASSY	Assembly
CB	Carriage Bolt
CHMSL	Center High-Mounted Stoplight
CNP	Cone Point
CS	Cap Screw
DIA	Diameter
ELEC	Electric
EX	External
FL	Flat
G	Grade
HC	High Capacity
HP	Horsepower
HSG	Housing
HX	Hex (Head)
ID	Inside Diameter
LG	Long
LK	Lock
MS	Machine Screw (fastener descriptions)
MS	Mild Steel (non-fastener descriptions)
NPTF	National Pipe Thread (Fluid)
NYIS	Nylon Insert
PH	Cross Recessed (Phillips Head)
PN	Pan
PT	Prevailing Torque
RC	Regular Capacity
SAE	Society of Automotive Engineers
SBH	Socket Button Head
SDTS	Self-Drilling Tap Screw
SFLS	Serrated Flange Lock Screw
SO	Socket Head
SP	Spring
SQ	Square
SS	Set Screw
STD	Standard
STS	Stainless Steel
T	Tooth/Teeth
TFTS	Thread Forming Tapping Screw
TY	Type
ZYC	Zinc Yellow Chromate
ZP	Zinc Plated

Chute Assembly - Regular Capacity

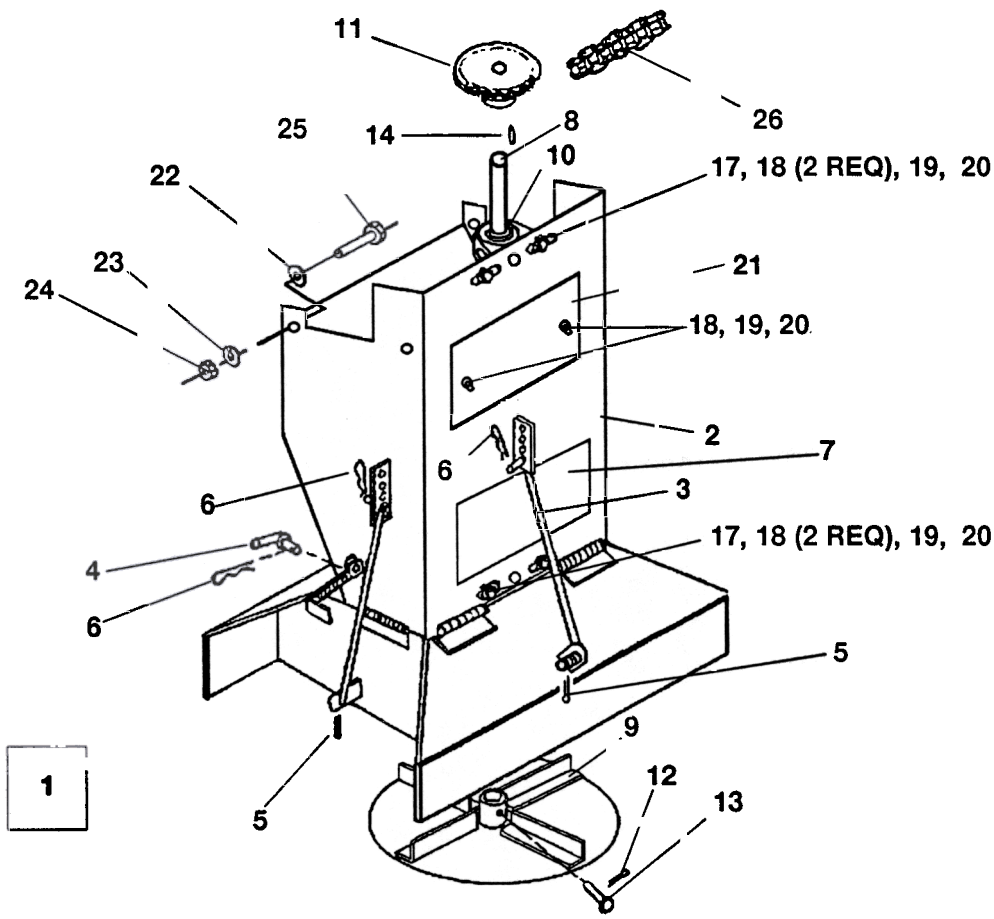
Items with a single part number or description are common to regular capacity mild steel and 16-gauge stainless steel 14" and 26" chute assemblies.



ITEM	PART NO.	QTY.	DESCRIPTION
1	9189	1	CHUTE ASSY 14" RC MS
1	9031	1	CHUTE ASSY 14" RC STS
1	9194	1	CHUTE ASSY 26" RC MS
1	9032	1	CHUTE ASSY 26" RC STS
2	. 9298	1	CHUTE HSG ASSY 14" RC MS
2	. 20092	1	CHUTE HSG ASSY 14" RC STS
2	. 9299	1	CHUTE HSG ASSY 26" RC MS
2	. 20093	1	CHUTE HSG ASSY 26" RC STS
3	. . 9195	3	CONTROL ROD 10"
4	. . 9201	2	ADJUSTMENT PIN
5	. . 91004	3	1/8X3/4 COTTER PIN ZP
6	. . 9261	5	3/32X2-1/4 HAIRPIN COTTER ZP
7	. . 20599	1	LABEL - INFORMATION (WARNING)
8	. 9191	1	SPINNER SHAFT RC ZYC (14" CHT)
8	. 9192	1	SPINNER SHAFT RC ZYC (26" CHT)
9	. 9196	1	SPINNER DISK RC MS
9	. 20095	1	SPINNER DISK RC STS
10	. 9193	2	3/4" PILLOW BLOCK BEARING
	. 9187	1	SPROCKET, #40X24TX3/4" ID
12	. 91022	1	1/16X1/2 COTTER PIN
13	. 9265	1	1/4 X 1-1/2 CLEVIS SHEAR PIN
14	. 9197	1	MACHINE KEY, 3/16" SQ X 1" LG

ITEM	PART NO.	QTY.	DESCRIPTION
17	. 90111	4	3/8-16X1-1/2 HX CS G5 ZP
17	. 91014	4	3/8-16X1-1/2 HX CS STS
18	. 90315	8	3/8 PLAIN WASHER TY A STD ZP
18	. 91006	8	3/8 PLAIN WASHER TY A STD STS
19	. 90361	4	3/8 SP LK WASHER ZP
19	. 91007	4	3/8 SP LK WASHER STS
20	. 90334	4	3/8-16 HX NUT ZP
20	. 91008	4	3/8-16 HX NUT STS
21	90315	4	3/8 PLAIN WASHER TY A STD ZP
21	91006	4	3/8 PLAIN WASHER TY A STD STS
22	90361	4	3/8 SP LK WASHER ZP
22	91007	4	3/8 SP LK WASHER STS
23	90334	4	3/8-16 HX NUT ZP
23	91008	4	3/8-16 HX NUT STS
24	90103	4	3/8-16X1 HX CS G5 ZP
24	91015	4	3/8-16X1 HX CS STS
25	9188	1	#40 ROLLER CHAIN, 38" LONG
*	. 20353	1	#40 ROLLER CHAIN MASTER LINK

Chute Assembly - High Capacity



ITEM	PART NO.	QTY.	DESCRIPTION
1	9107	1	CHUTE ASSY 31" HC MS
2	. 20318	1	CHUTE HSG ASSY 31" HC MS
3	. . 9195	3	CONTROL ROD 10"
4	. . 9201	2	ADJUSTMENT PIN
5	. . 91004	3	1/8 X 3/4 COTTER PIN ZP
6	. . 9261	5	3/32X2-1/4 HAIRPIN COTTER ZP
7	. . 20599	1	LABEL - INFORMATION (WARNING)
8	20320	1	SPINNER SHAFT HC ZYC (31" CHT)
9	20321	1	SPINNER DISK HC MS
10	20322	2	1" PILLOW BLOCK BEARING
11	20323	1	SPROCKET, #40 X 24T X 1" ID
12	91022	1	1/16X1/2 COTTER PIN ZP
13	20351	1	1/4" X 2" CLEVIS PIN ZP
14	20324	1	MACHINE KEY 1/4" SQ X 1" LG
17	90111	4	3/8-16/1-1/2 HX CS G5 ZP
18	90315	10	3/8 PLAIN WASHER TY A STD ZP
19	90361	6	3/8 SP LK WASHER ZP
20	. 90334	6	3/8-16 HX NUT ZP
21	. 20326	1	ACCESS PANEL
22	90315	4	3/8 PLAIN WASHER TY A STD ZP
23	90361	4	3/8 SP LK WASHER ZP
24	90334	4	3/8-16 HX NUT ZP
25	90103	4	3/8-16X1 HX CS G5 ZP
26	20325	1	#40 ROLLER CHAIN, 42" LONG
*	. 20353	1	#40 ROLLER CHAIN MASTER LINK

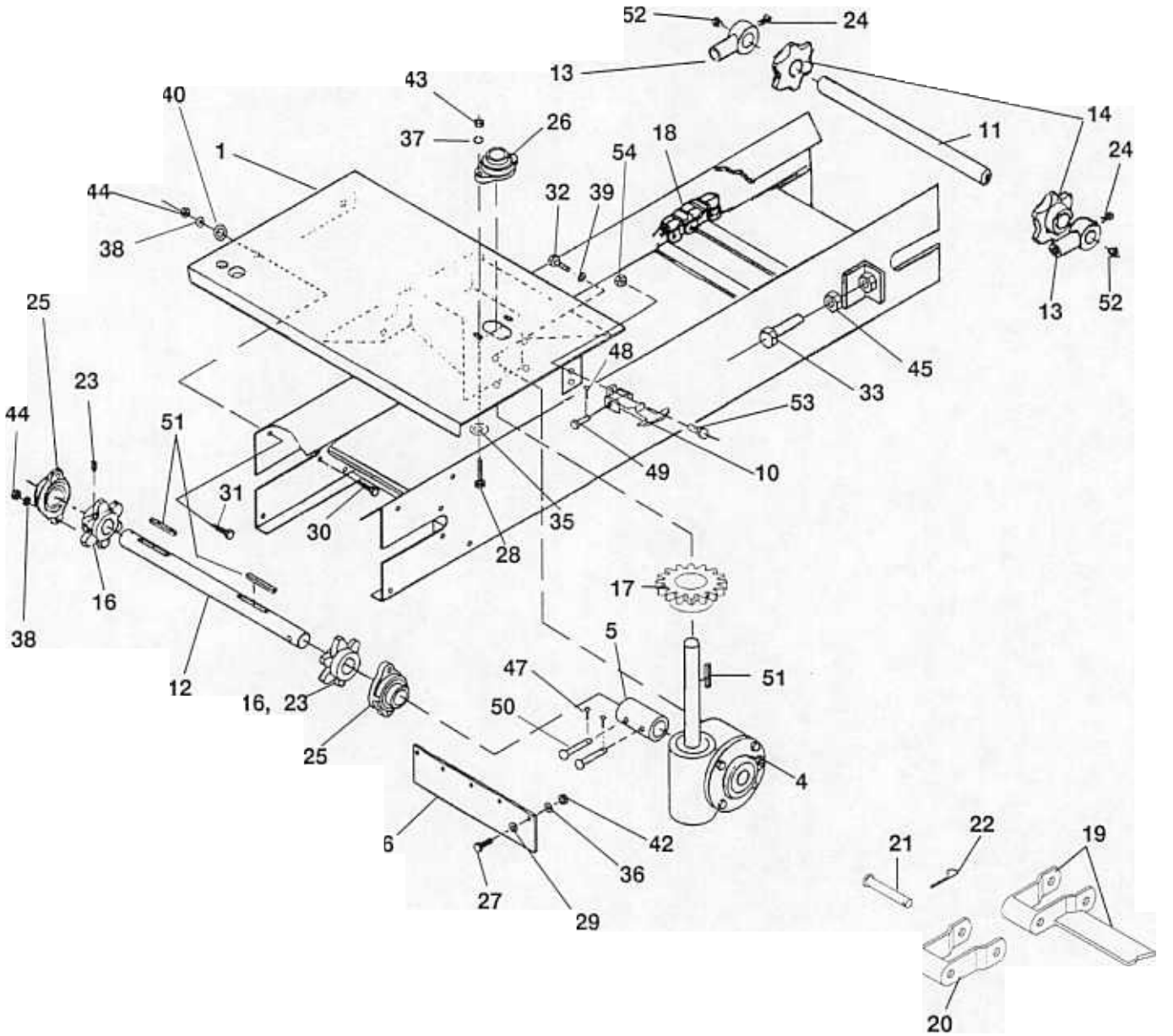
*Not Shown

Abbreviation Key found on page 11.

Indented parts are included in the assembly under which they are listed.

Quantities shown are included with the assembly.

Conveyor Drive and Idler - Regular Capacity



NOTE: Assemble chain link and pin to chain bar as shown.

Conveyor Drive and Idler - Regular Capacity

Items with a single part number or description are common to regular capacity, mild steel and 16-gauge stainless steel spreaders.

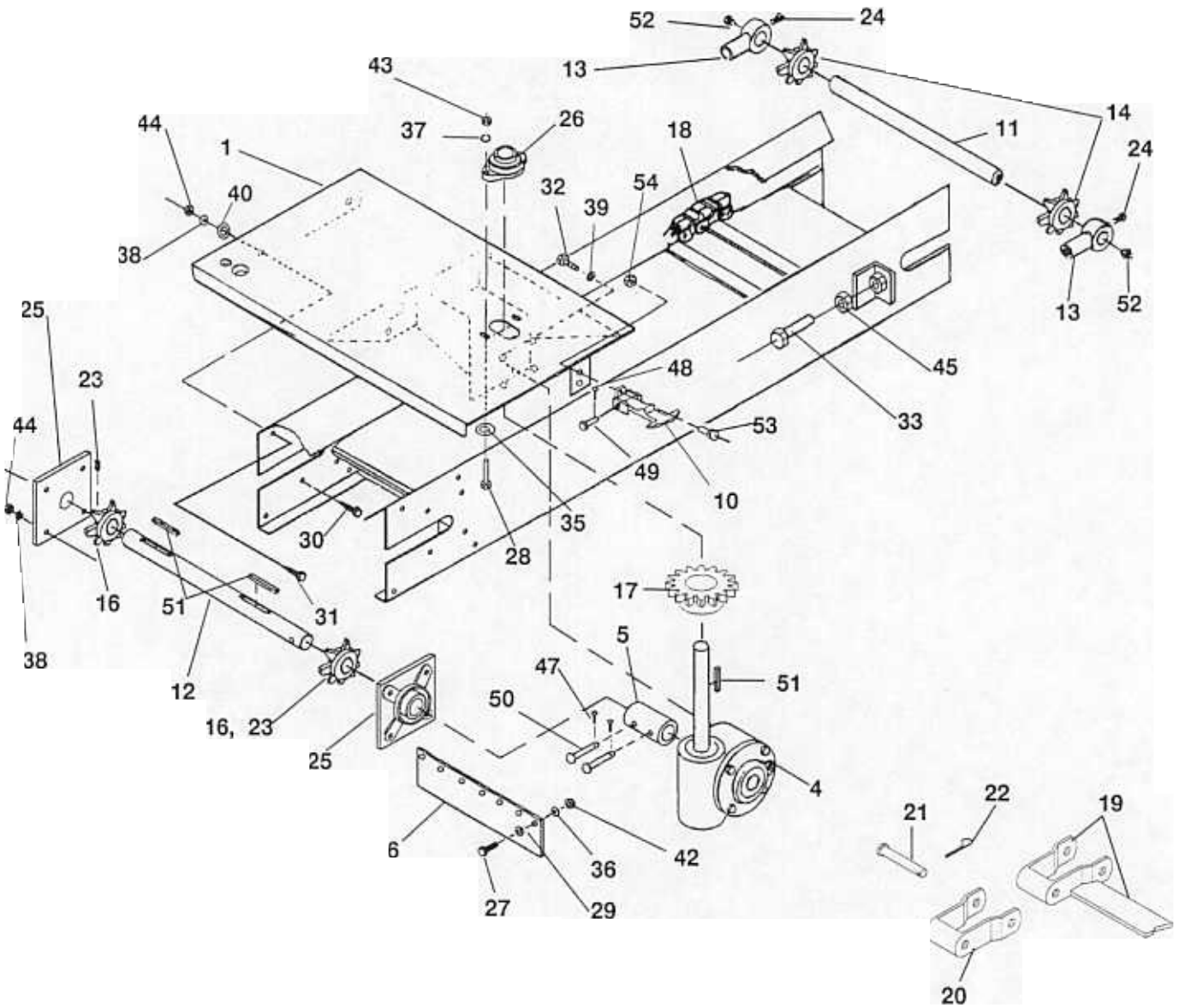
ITEM	PART NO.	QTY.	DESCRIPTION
1	20085	1	ENGINE BASE RC MS
1	20094	1	ENGINE BASE RC STS
4	9171	1	GEAR CASE
5	9169	1	DRIVE SHAFT COUPLING
6	9167	1	WIPER BELT RC
10	9172	2	STRAP, RUBBER HOLD DOWN
11	9184	1	IDLER SHAFT RC ZYC
12	9164	1	DRIVE SHAFT RC ZYC
13	9182	2	ROD END RC
14	9183	2	IDLER SPROCKET 6T
16	9163	2	DRIVE SPROCKET 6T
17	9174	1	SPROCKET #40X16TX1.0" ID
18	9177	1	CONVEYOR CHAIN 8' RC (12"-123 LINK)
19	. 9181	AR	CONVEYOR CHAIN BAR RC
20	. 9178	AR	CONVEYOR CHAIN LINK
21	. 9179	AR	CONVEYOR CHAIN PIN
22	. 91010	AR	3/32X1/2 COTTER PIN ZP
23	9447	2	1/4-20 X 1/2 SO SS CNP
24	91011	2	5/16-18X3/4 SQ SS STS
25	9162	2	1-1/8" 2 BOLT FLANGE BEARING
26	9176	1	1" 2 BOLT FLANGE BEARING
27	90461	5	1/4-20X3/4 HX CS G2 ZP
27	91012	5	1/4-20X3/4 HX CS STS
28	90054	2	5/16-18X1-1/2 HX CS G5 ZP
28	90977	2	5/16-18X1-1/2 HX CS STS
29	90311	5	1/4 PLAIN WASHER TY A STD ZP
29	91013	5	1/4 PLAIN WASHER TY A STD STS
30	67093	4	3/8-16X1-1/4 SBH CS STS
31	90103	4	3/8-16X1 HX CS G5 ZP
31	91015	4	3/8-16X1 HX CS STS
32	90608	4	1/2-13X1 HX CS G5 ZP
32	91016	4	1/2-13X1 HX CS STS
33	20150	2	5/8-11X6" TAKE UP BOLT ZYC
33	20151	2	5/8-11X6" TAKE UP BOLT STS
35	90980	2	5/16 PLAIN WASHER TY A STD STS
36	90359	5	1/4 SP LK WASHER ZP
36	91017	5	1/4 SP LK WASHER STS
37	90981	2	5/16 SP LK WASHER STS
38	90361	8	3/8 SP LK WASHER ZP
38	91007	8	3/8 SP LK WASHER STS
39	90364	4	1/2 SP LK WASHER ZYC
39	91018	4	1/2 SP LK WASHER STS
40	90315	4	3/8 PLAIN WASHER TY A STD ZP
40	91006	4	3/8 PLAIN WASHER TY A STD STS
42	90330	5	1/4-20 HX NUT ZP
42	91019	5	1/4-20 HX NUT STS
43	90332	2	5/16-18 HX NUT ZP
43	90988	2	5/16-18 HX NUT STS
44	90334	8	3/8-16 HX NUT ZP
44	91008	8	3/8-16 HX NUT STS
45	90343	2	5/8-11 HX NUT ZYC
45	91020	2	5/8-11 HX NUT STS
47	91021	2	1/8X1 COTTER PIN
48	91022	2	1/16X1/2 COTTER PIN ZP
49	20189	2	3/16X1-1/4" ZYC CLEVIS PIN
50	67147	2	3/8X2 CLEVIS PIN G5 ZYC
51	9166	3	MACHINE KEY, 1/4" SQ X1-1/2 LG
52	20188	2	GREASE FITTING - STRAIGHT
*	9333	4	TIE-DOWN CHAIN 36" LONG
*	9334	4	LINK - CHAIN TIE DOWN
53	67092	4	#10-24 X 1/2 SBH CS STS
54	91330	4	#10-24 PT HX LKNUT NYIS STS

* Not Shown

Abbreviation Key is found on page 11.

Indented parts are included in the assembly under which they are listed. Quantities shown are included with the assembly.

Conveyor Drive and Idler - High Capacity



Conveyor Drive and Idler - High Capacity

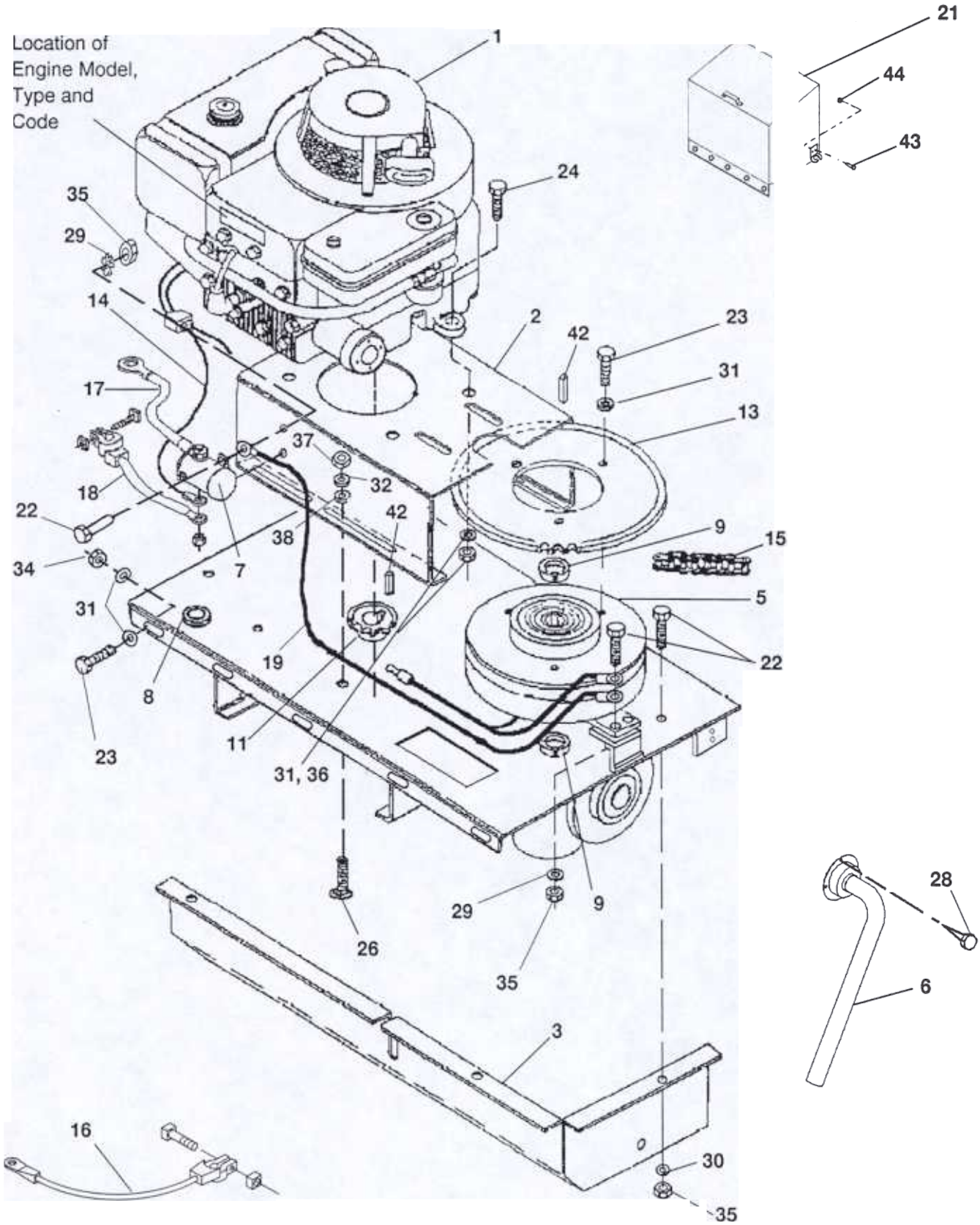
ITEM	PART NO.	QTY.	DESCRIPTION
1	20327	1	ENGINE BASE HC MS
4	9171	1	GEAR CASE
5	9169	1	DRIVE SHAFT COUPLING
6	20328	1	WIPER BELT HC
10	9172	2	STRAP, RUBBER HOLD DOWN
11	20329	1	IDLER SHAFT HC ZYC
12	20330	1	DRIVE SHAFT HC ZYC
13	20331	2	ROD END HC
14	20332	2	IDLER SPROCKET 8T
16	20333	2	DRIVE SPROCKET 8T
17	9174	1	SPROCKET, #40 X 16T X 1.0" ID
18	20334	1	CONVEYOR CHAIN 8' HC (16"-123 LINK)
18	20335	1	CONVEYOR CHAIN 10' HC (16"-153 LINK)
19	. 20336	AR	CONVEYOR CHAIN BAR HC
20	. 9178	AR	CONVEYOR CHAIN LINK
21	. 9179	AR	CONVEYOR CHAIN PIN
22	. 91010	AR	3/32X1/2 COTTER PIN ZP
23	9447	2	1/4-20 X 1/2 SO SS CNP
24	91011	2	5/16-18X3/4 SQ SS STS
25	20337	2	1-1/8" 4 BOLT FLANGE BEARING
26	9176	1	1" 2 BOLT FLANGE BEARING
27	90461	7	1/4-20X3/4 HX CS G2 ZP
28	90054	2	5/16-18X1-1/2 HX CS G5 ZP
29	90311	7	1/4 PLAIN WASHER TY A STD ZP
30	67093	8	3/8-16X1-1/4 SBH CS STS
31	90103	4	3/8-16X1 HX CS G5 ZP
32	90608	4	1/2-13X1 HX CS G5 ZP
33	20338	2	5/8-11 X 9" TAKE UP BOLT ZYC
35	90980	2	5/16 PLAIN WASHER TY A STD STS
36	90359	7	1/4 SP LK WASHER ZP
37	90981	2	5/16 SP LK WASHER STS
38	90361	12	3/8 SP LK WASHER ZP
39	90364	4	1/2 SP LK WASHER ZYC
40	90315	4	3/8 PLAIN WASHER TY A STD ZP
42	90330	7	1/4-20 HX NUT ZP
43	90332	2	5/16-18 HX NUT ZP
44	90334	12	3/8-16 HX NUT ZP
45	90343	2	5/8-11 HX NUT ZYC
47	91021	2	1/8X1 COTTER PIN
48	91022	2	1/16X1/2 COTTER PIN ZP
49	20189	2	3/16X1-1/4 ZYC CLEVIS PIN
50	67147	2	3/8X2 CLEVIS PIN G5 ZYC
51	9166	3	MACHINE KEY, 1/4" SQ X1-1/2 LG
52	20188	2	GREASE FITTING - STRAIGHT
*	9333	4	TIE-DOWN CHAIN 36" LONG
*	9334	4	LINK - CHAIN TIE DOWN
53	67092	4	#10-24 X 1/2 SBH CS STS
54	91330	4	#10-24 PT HX LKNUT NYIS STS

* Not Shown

Abbreviation Key is found on page 11.

Indented parts are included in the assembly under which they are listed. Quantities shown are included with the assembly.

Engine Drive with Clutch - Regular and High Capacity



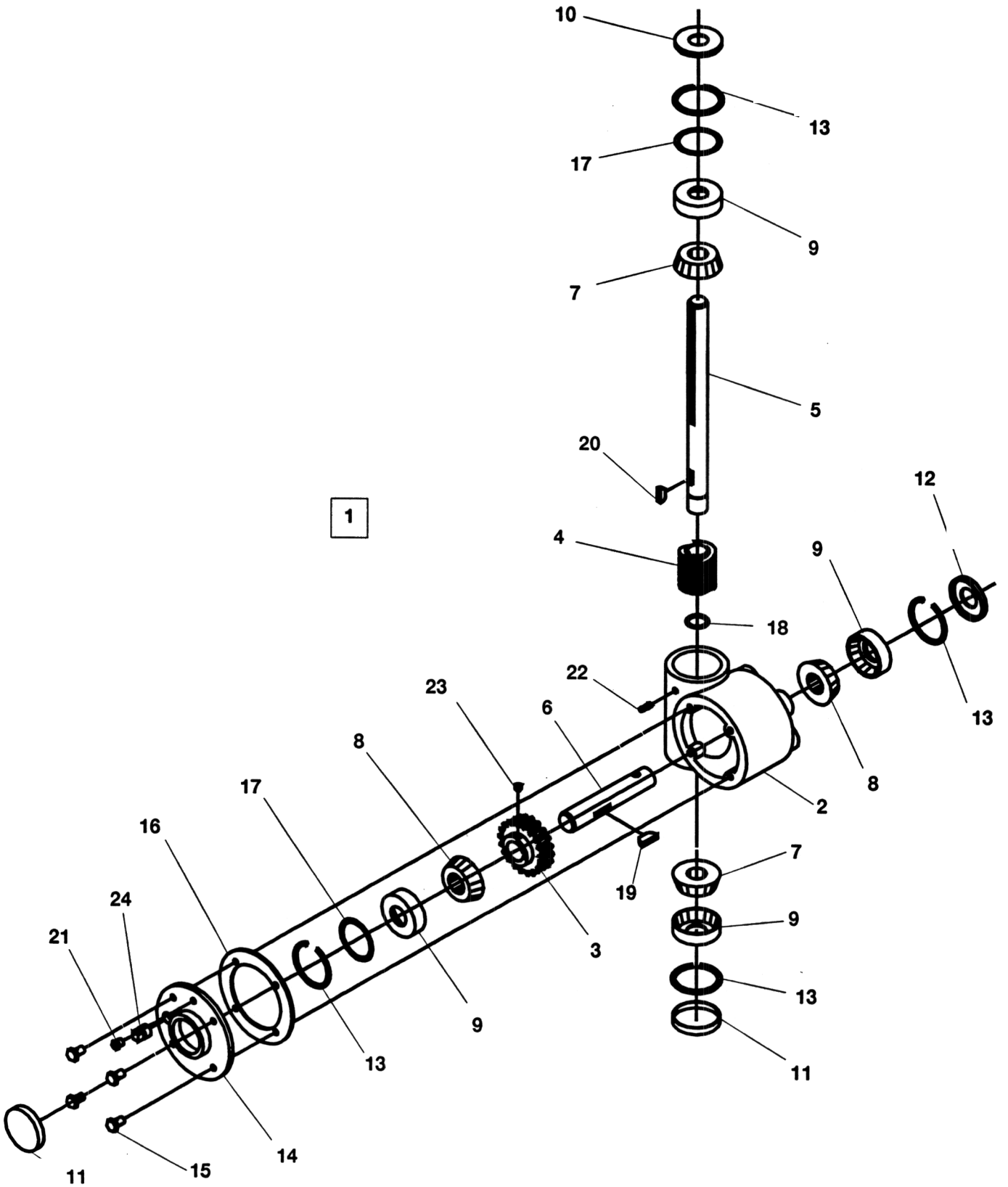
Engine Drive with Clutch - Regular and High Capacity

ITEM	PART NO.	QTY.	DESCRIPTION
1	9106	1	8.5 H.P. ENGINE
2	20084	1	ENGINE MOUNT RC
2	20339	1	ENGINE MOUNT HC
3	9208	1	CHAIN GUARD RC MS
3	20096	1	CHAIN GUARD RC STS
3	20340	1	CHAIN GUARD HC MS
*	9229	1	BATTERY CASE W/STRAP
5	9207	1	ELECTRIC CLUTCH
6	9000	1	TUBULAR EXHAUST EXTENSION
7	20136	1	RELAY - HOPPER SPREADER
8	9221	1	RUBBER GROMMET, 1"
9	9206	2	LOCKING COLLAR, 1"
11	9209	1	SPROCKET, #40 X 12 T X 1.0"
13	9202	1	SPROCKET, CLUTCH (#40 X 52 T)
14	20194	1	ALTERNATOR WIRE WITH PLUG
15	9220	1	#40 ROLLER CHAIN, 39" LONG (RC)
15	20341	1	#40 ROLLER CHAIN, 47" LONG (HC)
16	67239	1	BATTERY CABLE - BLACK 53" LG
17	9227	1	CABLE - STARTER
18	9226	1	RED BATTERY CABLE (POS)
19	67241	1	CLUTCH GROUND WIRE
21	9281	1	ENGINE COVER RC MS
21	20097	1	ENGINE COVER RC STS
21	20342	1	ENGINE COVER HC MS
22	90461	7	1/4-20X3/4 HX CS G2 ZP
22	91012	7	1/4-20X3/4 HX CS STS
23	90974	8	5/16-18X3/4 HX CS STS
24	90054	4	5/16-18X1-1/2 HX CS G5 ZP
26	90965	4	3/8-16X1 CB G5 ZP
26	91023	4	3/8-16X1 CB STS
28	91160	4	#8-18X3/8 SFLS TFTS TY AB ZP
29	91031	3	1/4 EX TOOTH LK WASHER ZP
29	67083	3	1/4 EX TOOTH LK WASHER STS
30	90359	3	1/4 SP LK WASHER ZP
30	91017	3	1/4 SP LK WASHER STS
31	90360	7	5/16 SP LK WASHER STS
32	90361	4	3/8 SP LK WASHER ZP
32	91007	4	3/8 SP LK WASHER STS
33	90980	10	5/16 PLAIN WASHER TY A STD STS
34	90987	5	5/16-18 PT HX LK NUT NYIS STS
35	90330	7	1/4-20 HX NUT ZP
35	91019	7	1/4-20 HX NUT STS
36	90332	4	5/16-18 HX NUT ZP
36	90988	4	5/16-18 HX NUT STS
37	90334	4	3/8-16 HX NUT ZP
37	91008	4	3/8-16 HX NUT STS
38	90315	4	3/8 PLAIN WASHER TY A STD ZP
38	91006	4	3/8 PLAIN WASHER TY A STD STS
42	9166	2	KEY, .25 SQ X 1-1/2" LG
43	67092	4	#10-24X1/2 SBH CS STS
44	91330	4	#10-24 PT HX LKNUT NYIS STS
*	20353	1	#40 ROLLER CHAIN MASTER LINK

* Not Shown

Items with a single part number or description are common to regular capacity (mild steel and 16-gauge stainless steel) and high capacity spreaders.

Gear Case


10
13
17
9
7
5
20
1
4
12
9
18
22
23
6
8
17
16
24
21
3
19
7
9
13
11
2
8
13
9
13
14
15
11

Gear Case

ITEM	PART NO.	QTY.	DESCRIPTION
1	9171	1	GEAR CASE
2	. 67245	1	GEAR CASE HOUSING
3	. 67246	1	GEAR (BRONZE)
4	. 67247	1	WORM GEAR
5	. 67265	1	INPUT SHAFT
6	. 67266	1	OUTPUT SHAFT
7	. 67249	2	BEARING CONE
8	. 67248	2	BEARING CONE
9	. 67250	4	BEARING CUP
10	. 67251	1	SEAL
11	. 67252	1	CAP
12	. 67253	1	SEAL
13	. 67254	2	SNAP RING
14	. 67255	1	COVER
15	. 67256	4	CAP SCREW
16	. 67257	1	GASKET
17	. 67258	AR	SHIM (0.020" THK)
18	. 67259	1	SNAP RING
19	. 67260	1	WOODRUFF KEY (# 18 - HARDENED)
20	. 67261	1	WOODRUFF KEY ("A" - HARDENED)
21	. 67262	1	1/8 VENT PLUG
22	. 67263	1	ZERK FITTING
23	. 67264	1	SET SCREW
24	. 7621	1	PLUG 3/8 NPTF SQ

* Not Shown

Abbreviation Key is found on page 11.

Indented parts are included in the assembly under which they are listed. Quantities shown are included with the assembly.

Gear Case Assembly

Housing Pre-assembly

1. Insert the snap ring into the output bore of the housing.
2. Insert an output bearing cup into the housing bore using a cup driver or a brass drift. Press the cup tight against the snap ring.
3. Insert the snap ring into the input bore opposite the grease zerk hole. Press an input bearing cup tight against the snap ring.
4. Install and tighten the grease zerk into the housing.

Cover Pre-assembly

1. Insert the snap ring into the output bore of the cover.
2. Press an output bearing cup in tight against the snap ring.
3. Install all vent and fill plugs into the cover.

Output Shaft Pre-assembly

Install the woodruff key into the keyway.

Input Shaft Pre-assembly

1. Install the snap ring in the snap ring groove.
2. Install the woodruff key into the keyway.
3. Slide the worm gear on tight to the snap ring making sure the key does not fall out.
4. Slide the input shaft bearing cones tight against the worm gear and snap ring.

Assembly of Pre-assembled Parts

1. Insert the input shaft into the housing making sure the shaft extends out the proper side.
2. Press an input bearing cup and a snap ring into the input bore of the housing.
3. Adjust the bearings by tapping lightly on each end of the shaft with a soft hammer. If endplay exists, add shims under the snap ring and repeat adjustment until the shaft spins freely with no endplay.

Continued on next page.

Insert an output bearing cone and the bronze gear into the housing. Slide the output shaft through the bronze gear and bearing cone, taking care not to scratch the shaft.

NOTE: The end of the output shaft should extend 1.94" beyond the machined mounting surface on the back side of the housing.

Install and tighten the D43 set screw into the bronze gear. Insert an output bearing cone on the shaft until it is tight against the bronze gear.

Install a gasket on the cover and insert it over the end of the output shaft. Tighten the cover down.

Adjust the bearings by tapping lightly on each end of the shaft with a soft hammer. If endplay exists, add shims under the snap ring and repeat adjustment until the shaft spins freely with no endplay.

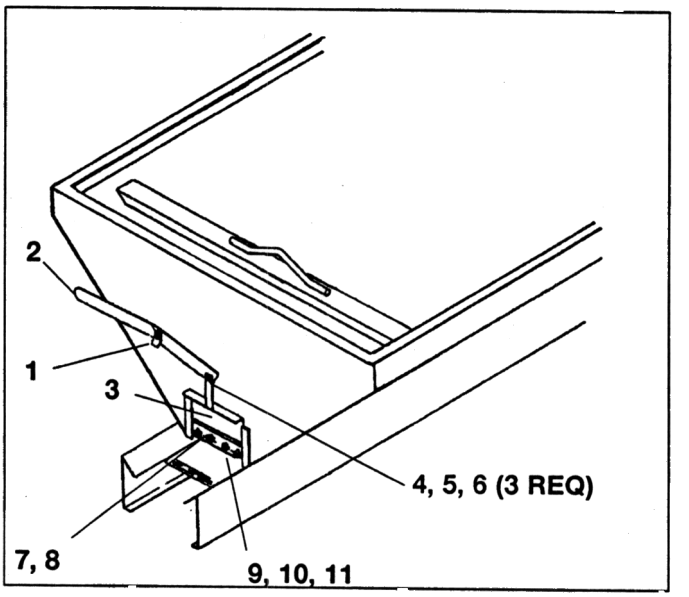
6. Grease the lips of the output and input shaft seals and install the seals. Verify the seals are seated flush (not cocked) in the housing. Use a seal protector when installing any seals over a keyway.
7. Install the caps in the input and output bores using a sealant on both the cap outer diameter and the bore inner diameter.
8. Remove the vent plug and pressurize the housing with low pressure air (about 3 psi). Brush a soap and water mix over the seals, caps, and gaskets and check for leaks.
9. Install the gear case on spreader, grease input shaft bearing, and fill unit with gear oil to a level even with the fill hole.

Gear Case Disassembly

To disassemble the gear case, reverse the Gear Case Assembly. Take extreme caution when removing the bearings. A light tap on the bearing cups may be needed to remove the snap rings.

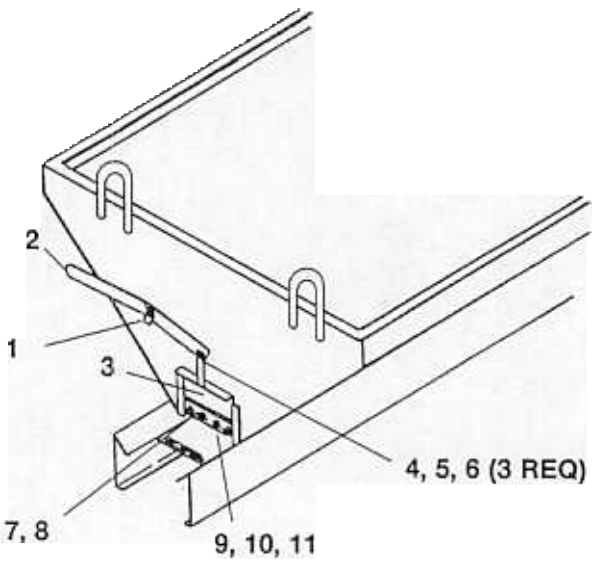
Feed Gate - Regular Capacity

Items with a single part number or description are common to regular capacity, mild steel and 16-gauge stainless steel spreaders.



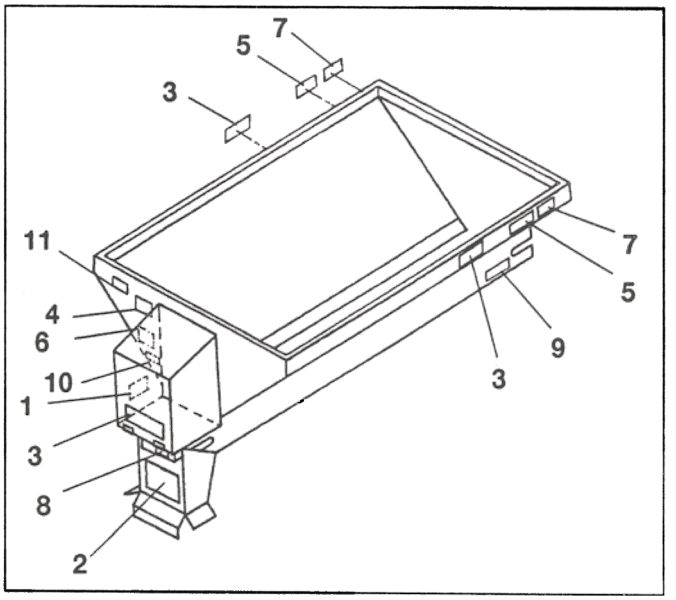
ITEM	PART NO.	QTY.	DESCRIPTION
1	9231	1	WING NUT
1	20098	1	WING NUT - STS
2	9232	1	FEED GATE LEVER RC MS
2	20099	1	FEED GATE LEVER RC STS
3	9233	1	FEED GATE RC MS
3	20100	1	FEED GATE RC STS
4	90965	1	3/8-16X1 CB G5 ZP
4	91023	1	3/8-16X1 CB STS
5	90986	1	3/8-16 PT HX JAM LKNUT NYIS ZP
5	90999	1	3/8-16 PT HX JAM LKNUT NYIS STS
6	90315	2	3/8 PLAIN WASHER TY A STD ZP
6	91006	2	3/8 PLAIN WASHER TY A STD STS
7	9234	1	FEED GATE WIPER RC
8	9235	1	FEED GATE ANGLE RC MS
8	20102	1	FEED GATE ANGLE RC STS
9	91030	4	1/4-20X3/4 FL MS ZP
9	91025	4	1/4-20X3/4 FL MS STS
10	90330	4	1/4-20 HX NUT ZP
10	91019	4	1/4-20 HX NUT STS
11	90359	4	1/4 SP LK WASHER ZP
11	91017	4	1/4 SP LK WASHER STS

Feed Gate - High Capacity



ITEM	PART NO.	QTY.	DESCRIPTION
1	9231	1	WING NUT
2	20344	1	FEED GATE LEVER HC MS
3	20345	1	FEED GATE HC MS
4	90965	1	3/8-16X1 CB G5 ZP
5	90986	1	3/8-16 PT HX JAM LKNUT NYIS ZP
6	90315	2	3/8 PLAIN WASHER TY A STD ZP
7	20346	1	FEED GATE WIPER HC
8	20347	1	FEED GATE ANGLE HC MS
9	91030	6	1/4-20X3/4 FL MS ZP
10	90330	6	1/4-20 HX NUT ZP
11	90359	6	1/4 SP LK WASHER ZP

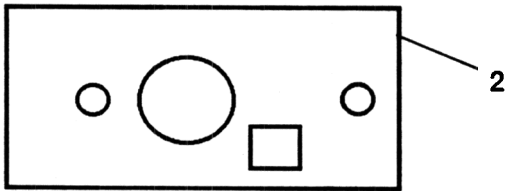
Labels - Regular and High Capacity



ITEM	PART NO.	QTY.	DESCRIPTION
1	9131	1	LABEL - WARNING - Fire Hazard
2	20599	1	LABEL - WARNING - Rotating Spinner
3	20724	3	FISHER® DECAL 4-1/2 X 15
4	20598	1	LABEL - WARNING - Read Instruction Manual
5	9133	2	LABEL - WARNING - Overloaded Vehicles
6		1	LABEL - SERIAL - Serial No.
7	9129	2	LABEL - WARNING - Do Not Ride
8	9134	1	LABEL - WARNING - Moving Parts
9	9414	2	LABEL - WARNING - Conveyor Chain
10	20600	1	LABEL - WARNING - Electric Shock
11	20143	1	LABEL - CAUTION - Unused Material

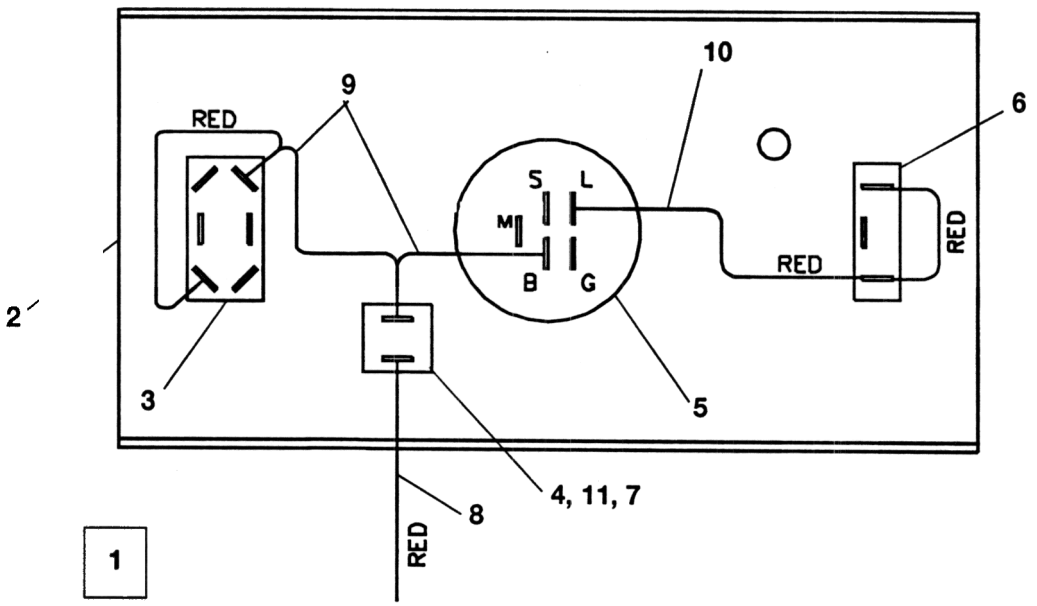
Cab Control

Front View



Electric Throttle

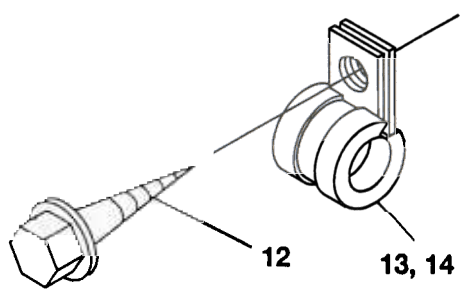
Back View



ITEM	PART NO	QTY.	DESCRIPTION
1	20354	1	CAB CONTROL (ELEC. THROTTLE)
2	. 9427	1	CONTROL PANEL - ELEC THROTTLE
3	. 9422	1	ELECTRIC THROTTLE SWITCH
4	. 67026	1	FUSE HOLDER
5	. 20162	1	KEYED IGNITION SWITCH
6	. 9237	1	CLUTCH SWITCH
7	. 67027	1	FUSE CAP
*	. 65368	1	KEY - HOPPER SPREADER
8	. 20088	1	POWER WIRE - RED
9	. 20089	1	JUMPER WIRE - RED - 4 TERMINAL
10	. 20090	1	JUMPER WIRE - RED - 3 TERMINAL
11	. 20086	1	FUSE 3 AG - 10 AMP
12	90681	AR	1/4X3/4 HX SDTS ZP
13	9472	AR	CLAMP LOOP #10
14	9415	AR	CLAMP LOOP #6
*	3042	AR	RUBBER GROMMET 3/8" ID
*	8329	1	DIELECTRIC GREASE TUBE

* Not shown

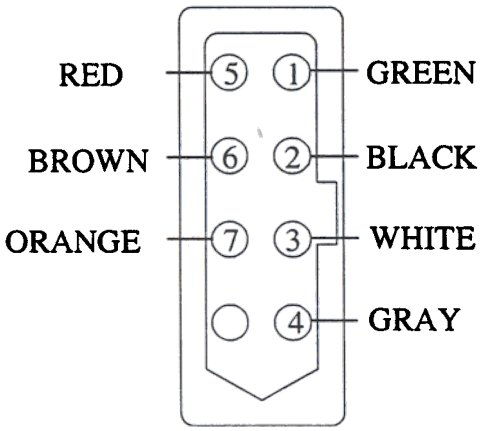
Clamp Loops

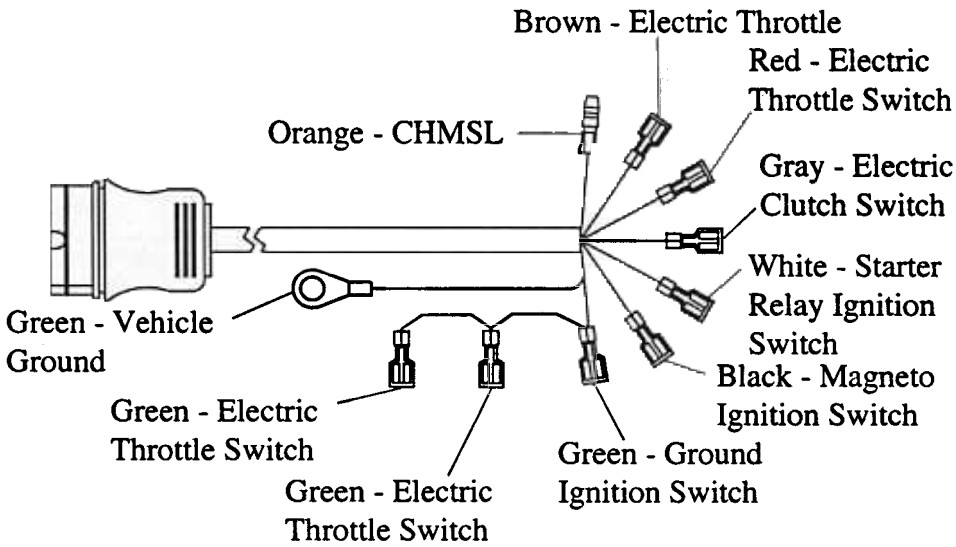


Used to secure spreader harness and spreader cable to the spreader and the cab control.

Vehicle Harness

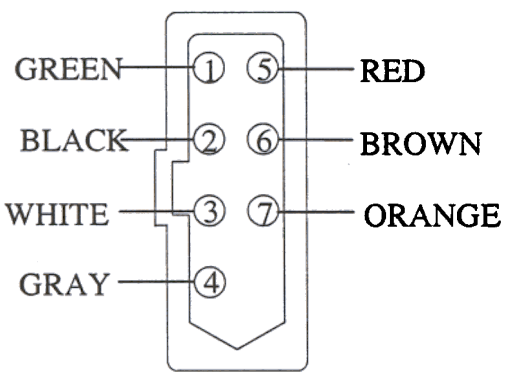
Part Number: 20072

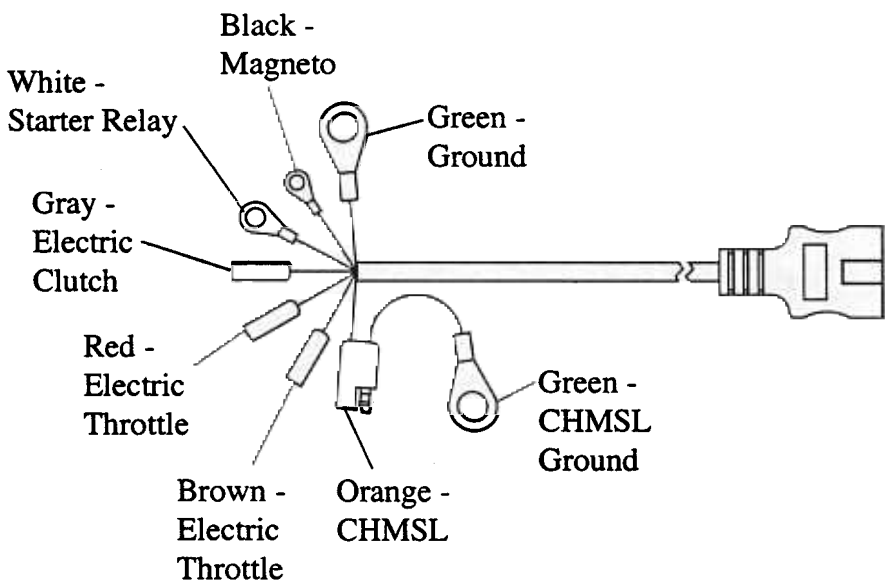



Brown - Electric Throttle
Red - Electric Throttle Switch
Orange - CHMSL
Gray - Electric Clutch Switch
White - Starter Relay Ignition Switch
Green - Vehicle Ground
Black - Magneto Ignition Switch
Green - Electric Throttle Switch
Green - Ground Ignition Switch
Green - Electric Throttle Switch

Spreader Harness

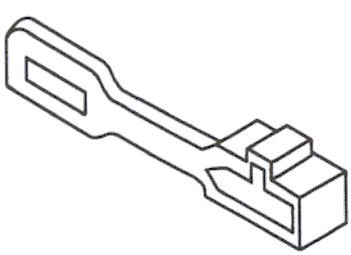
Part Number: 20073





Plug Cover

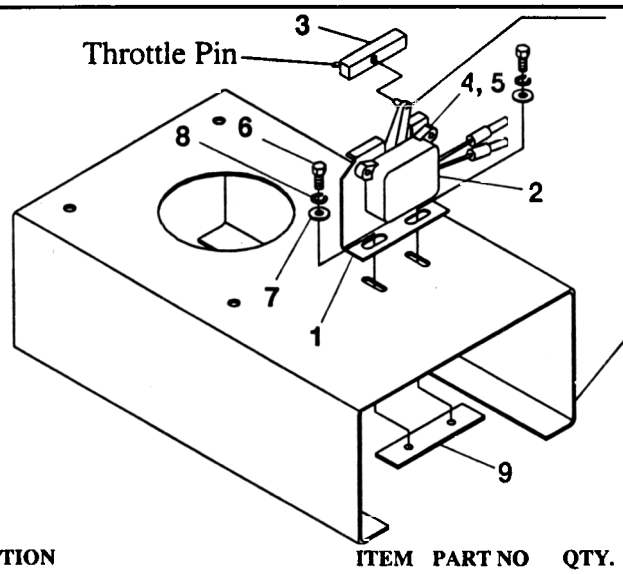
Part Number: 8291



Hook

Part Number: 20128

Electric Throttle



ITEM	PART NO	QTY.	DESCRIPTION
1	20163	1	ELECTRIC THROTTLE BRACKET
2	20134	1	ELECTRIC THROTTLE MOTOR
3	20129	1	ELECTRIC THROTTLE ARM
4	67091	3	#6-32X5/8 SBH CS STS
5	91027	3	#6-32 PT HX LK NUT NYIS STS
6	90461	2	1/4-20X3/4 HX CS G5 ZP
7	90311	2	1/4 PLAIN WASHER TY A STD ZP
8	90359	2	1/4 SP LK WASHER ZP
9	20359	1	NUT BAR

Removal Instructions

1. Disconnect the battery cables.
2. Carefully observe the existing installation. Mark the electric throttle bracket position on the engine mount.
3. Disconnect the brown and red spreader harness wires from the electric throttle motor leads.
4. Remove 1/4-20 fasteners that hold the electric throttle bracket to the engine mount.
5. Remove #6-32 fasteners holding the electric throttle motor to the bracket. Remove the electric throttle motor.

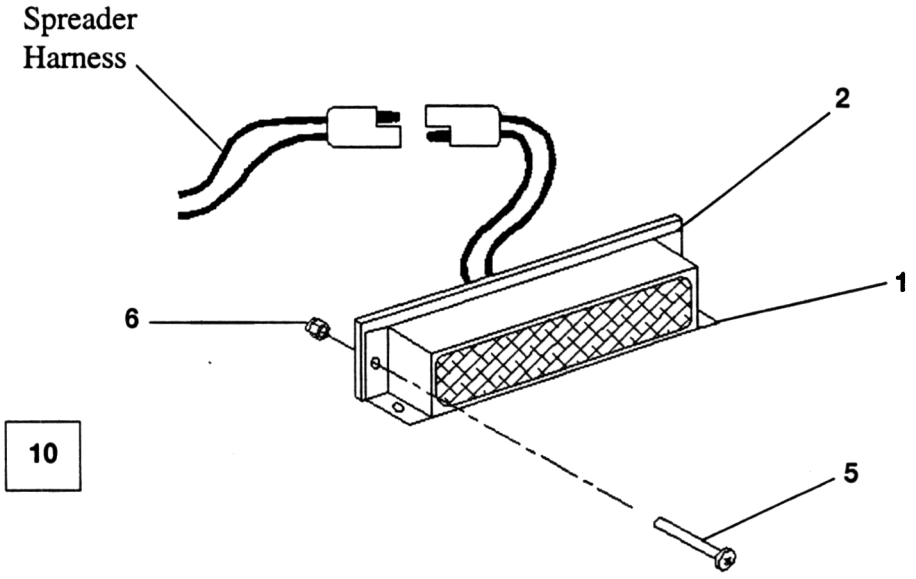
Installation Instructions

CAUTION: Improper installation can result in damage to the engine choke/throttle linkage.

1. Connect the brown and red spreader harness wires (not shown) to the corresponding colored electric throttle motor leads.
2. Using the electric throttle control, run the new motor until the crank reaches the 12 o'clock position. (A 9-volt battery can be a substitute for the control.)
3. Fasten the electric throttle motor to the bracket using the existing hardware.
4. Using the electric throttle control, run the new electric throttle motor until the crank is against the bracket as shown in above diagram.
5. Place the electric throttle arm on the crank as shown in the above diagram.
6. Place the electric throttle assembly onto the engine mount inserting the throttle pin into the engine choke/throttle linkage plastic slider (not shown).
7. Loosely bolt electric throttle assembly to the engine mount with the existing hardware.
8. Keeping the electric throttle arm parallel to and against the carburetor control bracket, move the electric throttle bracket forward putting the engine throttle into the full choke position.
9. Tighten the fasteners according to the Torque Chart on page 4.
10. Reconnect the battery cables.

1 Verify the crank is stopped in both directions by the bracket, not the carburetor linkage.

Center High-Mounted Stoplight (CHMSL) Kit



ITEM	PART NO.	QTY.	DESCRIPTION
10	9486	1	STOPLAMP KIT
1	. 9487	1	STOPLIGHT ASSEMBLY W/ GASKET
2	. . 9488	1	STOPLIGHT GASKET
*	. 9489	1	VEHICLE HARNESS-STOPLIGHT
*	. 9493	1	PARTS BAG ASSY
*	. . 9490	1	PROTECTOR PLUG SAE 2 CONTACT
5	. . 90693	2	#6-32 X3/4 PH PN MS STS
6	. . 90694	2	#6-32 PT HX LK NUT NYIS STS
*	. . 5793	1	BUTT SPLICE
*	. . 8329	1	DIELECTRIC GREASE TUBE
*	. 3666	10	CABLE TIE
*	. 6456	1	9-1-93 LITERATURE CHMSL
*	. 13658	1	CHMSL INSTALLATION

Installation Instructions

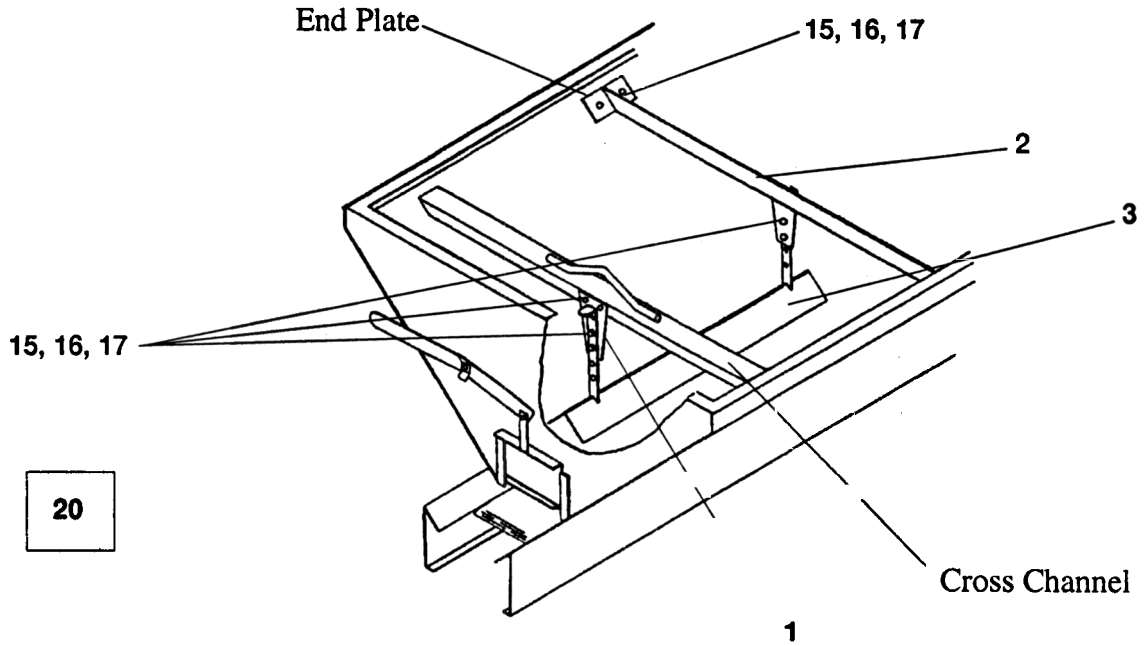
Use the CHMSL manual supplied with the kit for installation except for the following situations:

- The CHMSL harness and the protective plug (supplied with the CHMSL kit) are *NOT* used. The CHMSL plugs into the SAE two-pin connector included as part of the spreader harness.
- The orange CHMSL feedwire from the cab control is connected to the vehicle CHMSL signal. See Cab Control and Wire Harness Installation.

Indented parts are included in the assembly under which they are listed. Quantities shown are included with the assembly.

* Not shown

Inverted Vee Assembly - Regular Capacity Mild Steel



ITEM	PART NO.	QTY.	DESCRIPTION
20	9138	1	INVERTED VEE KIT RC MS
1	. 20164	1	INVERTED VEE PLATE
2	. 20165	1	INVERTED VEE SUPPORT
3	. 65994	1	INVERTED VEE RC MS
15	. 90103	10	3/8-16X1 HX CS G5 ZP
16	. 90361	10	3/8 SP LK WASHER ZP
17	. 90334	10	3/8-16 HX NUT ZP

Indented parts are included in the assembly under which they are listed.

Installation Instructions

1. Center the inverted vee plate on the engine side of the cross channel with the wide end of the plate facing up.
2. Using the two holes at the wide end of the plate as a template, drill two 7/16" diameter holes through one leg of the cross channel support. Assemble with two 3/8" x 1" hex head cap screws, lock washers, and nuts.

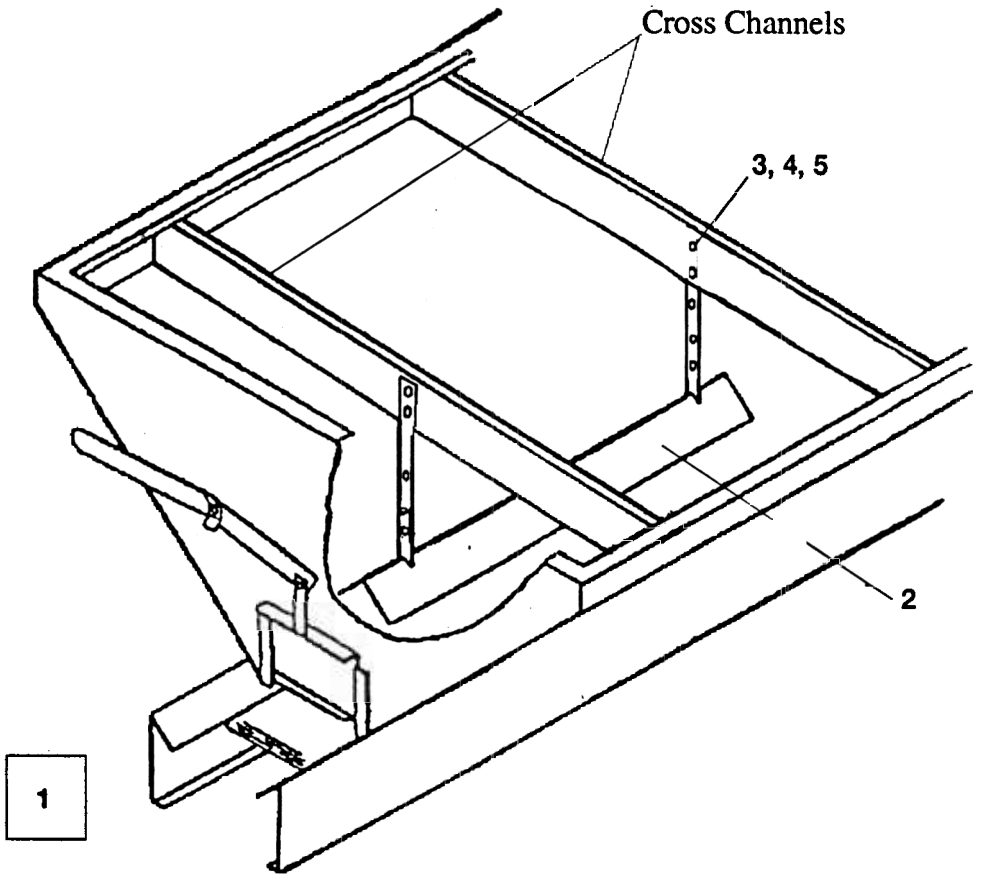
CAUTION: Before drilling any holes, check both sides of the material for any wires, fuel lines, fuel tanks, etc. that may be damaged by drilling.

3. Assemble the inverted vee to the inverted vee support and to the inverted vee plate (installed in step 1) with four 3/8" x 1" hex head cap screws, lock washers, and nuts.
4. Install item 2, inverted vee support, parallel to the top of the hopper. Using the two holes in the end plates of the support as a guide, drill two 7/16" holes through each side of the spreader.

NOTE: Fasten a 3/8" x 1" hex head cap screw, lock washer, and nut in each hole as it is drilled. This will hold the support in place as you drill your next hole.

5. Adjust the height of the inverted vee for the material being spread:
   - *Salt or dry sand* - adjust the vee to the lowest position.
   - *Salt/sand mix* - adjust the vee to the middle position.
   - *Wet sand* - adjust the vee to the highest position.
6. Tighten all fasteners according to the Torque Chart on page 4.

Inverted Vee Assembly - Regular Capacity Stainless Steel



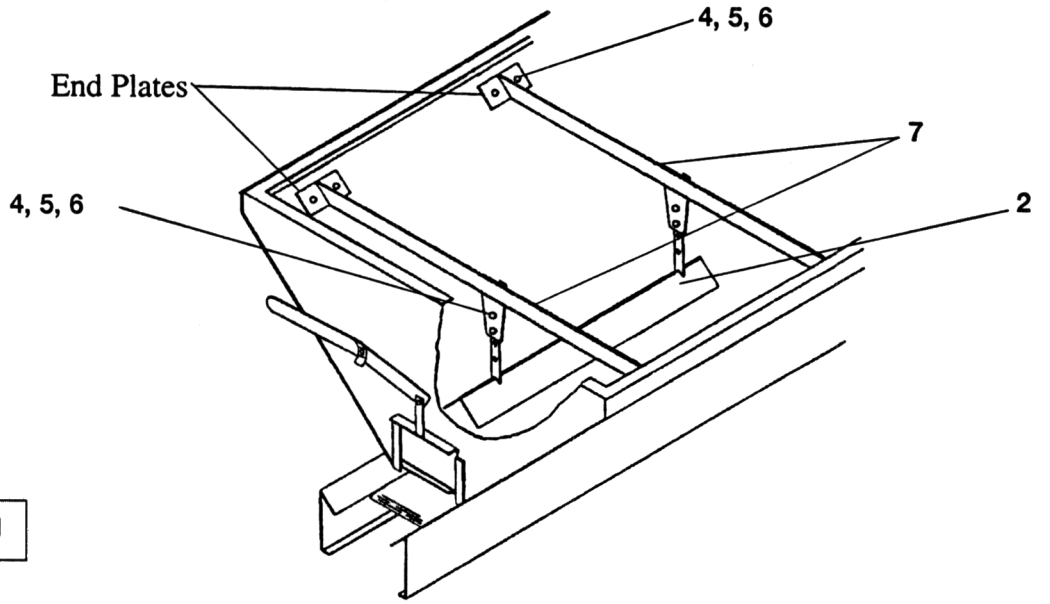
ITEM	PART NO.	QTY.	DESCRIPTION
1	20166	1	INVERTED VEE KIT RC MS
2	. 65995	1	INVERTED VEE RC STS
3	. 91015	4	3/8-16X1 HX CS STS
4	. 91007	4	3/8 SP LK WASHER STS
5	. 91008	4	3/8-16 HX NUT STS

Indented parts are included in the assembly under which they are listed.

Installation Instructions

1. Select the height for the inverted vee for the material being spread:
   - *Salt and dry sand* - adjust the vee to the lowest position.
   - *Salt/sand mix* - adjust the vee to the middle position.
   - *Wet sand* - adjust the vee to the highest position.
2. Attach the inverted vee to the cross channels with the provided fasteners.
3. Tighten all fasteners according to the Torque Chart on page 4.

Inverted Vee Assembly - High Capacity



ITEM	PART NO.	QTY.	DESCRIPTION
1	9347	1	INVERTED VEE KIT 8' HC MS
1	9155	1	INVERTED VEE KIT 10' HC MS
2	. 20348	1	INVERTED VEE 8' HC MS
2	. 20349	1	INVERTED VEE 10' HC MS

ITEM	PART NO.	QTY.	DESCRIPTION
4	. 90103	12	3/8-16X1 HX CS G5 ZP
5	. 90361	12	3/8 SP LK WASHER ZP
6	. 90334	12	3/8-16 HX NUT STS
7	. 20165	2	INVERTED VEE SUPPORT

Installation Instructions

1. Assemble the inverted vee to the inverted vee supports using four 3/8" x 1" hex head cap screws, lock washers, and nuts.
2. Place the inverted vee/inverted vee support assembly into the spreader as shown on the above diagram. The end of the inverted vee should be 8-10" away from the feed gate, and the inverted vee supports should be parallel to the top of the spreader.
3. Using the holes in the end plates of the supports as guides, drill 7/16" holes through each side of the spreader.

CAUTION: Before drilling any holes, check both sides of the material for any wires, fuel lines, fuel tanks, etc. that may be damaged by drilling.

CAUTION: Verify the spreader's side supports are not in the way of the holes to be drilled.

NOTE: Fasten a 3/8" x 1" hex head cap screw, lock washer, and nut in each hole as it is drilled. This will hold the support in place as you drill your next hole.

4. Adjust the height of the inverted vee for the material being spread.
   - *Salt or dry sand*: adjust the vee to the lowest position.
   - *Salt/sand mix*: adjust the vee to the middle position.
   - *Wet sand*: adjust the vee to the highest position.
5. Tighten all fasteners according to the Torque Chart on page 4.

FISHER ENGINEERING
12 WATER STREET
P.O. BOX 529
ROCKLAND, MAINE 04841

A DIVISION OF DOUGLAS DYNAMICS, L.L.C.

Form No. 80324

Printed in the U.S.A.

November 1. 1996